

COAL AGE

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A Serious Coal Situation

By FLOYD W. PARSONS

THE present is not a time for disputes among ourselves. We have an enemy without who threatens our very existence. Victory in our Nation's fight for freedom is only delayed by such dissensions as have arisen between Government officials in charge of the railroads and the Fuel Administration.

John Skelton Williams, lieutenant for Mr. McAdoo, in charge of purchases for the country's transportation lines, is responsible for the National railroad policy of demanding coal at prices less than those fixed by the President. Mr. Williams started with the idea that this saving to the roads was \$209,000,000 each year. He knows now that the actual saving is approximately 25 cents per ton on 150 million tons, or about \$38,000,000 annually.

There is no doubt that President Wilson will be compelled to render a decision. Whatever this conclusion may be, his verdict must be final and must be faithfully observed by all, no matter what sacrifice it entails.

It is already evident that the President recognizes the absolute necessity of an equitable car supply. He knows that the great problem of coal distribution will break down if one-third of the country's production is exempted from operation of the rules promulgated by the Fuel Administration. He knows also that mine labor will not serve the Nation faithfully in this hour of need if the Government sanctions a plan that permits one-third of the miners to work full time while the other two-thirds barely earn a living.

On the other hand, President Wilson appears inclined to favor a saving for the roads. Two ways to accomplish this end have been suggested. The first would permit the railroads to buy their fuel on a cost-plus basis. This scheme is impractical, for it would mean that settlement for this coal would be pending in the courts one hundred years hence—not a pleasant heritage to bequeath to the next generation.

The only other plan is to tear away the camouflage that surrounds the problem and call it what it is—a direct tax of nearly forty million dollars

on the whole bituminous industry. The burden must be distributed evenly. Every producer of bituminous coal in such event must sell his entire output at a tonnage price 7c. less than he now receives, this difference to be paid into the Treasury of the United States. The total amount can be handed to the railroads later for their operating expenses. It should, however, be tax exempt.

Mr. Williams says he wants to save for the people, and denies that his primary aim is to show favorable results under government ownership. That being the case, let it be done directly so everyone will understand. In the past the mine owners who sold coal to the railroads at a reduced price at least had an opportunity by skillful management to even up on other sales. Today this opportunity is denied them, for the maximum price they may receive is fixed. The present situation has no parallel in the past.

Since this Nation entered the War, the railroads in many localities have demanded a grade of coal for their locomotives that was not necessary, and that was specially adapted for use in munition plants. The result has been deplorable, for in many cases the production of war supplies has been hampered by manufacturers having to use coal unsuited for their purposes, but which coal burned in locomotives would have met all requirements.

Any man in Washington today who places personal ambitions above his country's welfare is certainly unworthy of high office. When such a man denounces everyone who opposes him as a profiteer and a traitor, he is assuming an attitude of superior virtue that must arouse suspicion.

The coal industry must have confidence that justice will ultimately prevail. Dr. Garfield is a man not easily turned from his course. The President has a faculty for getting to the basic facts in matters of importance. Let us therefore have hope, and whatever the outcome, let coal men prove that the highest patriotism is evidenced by loyal action and not by noisy declarations.

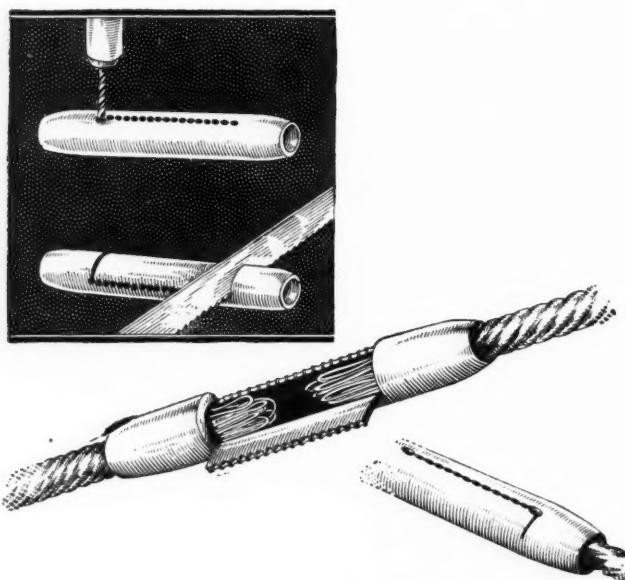
IDEAS AND SUGGESTIONS

Substitute for a Rope Splice.

BY L. V. LOUTHER
Guttenberg, N. J.

To neatly splice a wire rope is apt to be a long and somewhat difficult job for a novice. In many instances where the splice need not be the same size as the original rope and the conditions of service do not demand flexibility of the puncture a substitute similar to the one shown in the accompanying illustration may be used to advantage.

To make this kind of a "splice" proceed as follows: Secure a short piece of pipe slightly larger in internal diameter than the external diameter of the cable. Swedge down the ends of this pipe until the wire rope can just be inserted therein. Drill and saw one longitudinal and two transverse cuts, as shown, folding back the "leaf" thus formed. Thoroughly clean the inside of the pipe and treat with acid or soldering salts, also cut out the hemp center of the cable, if any, for a short distance at the ends where it enters the pipe sleeve. Clean the individual wires and treat with acid. Now insert the cable in either end of the pipe sleeve and bend the wires separately back upon themselves. Bend the leaf back into place, heat the whole sleeve slightly and pour in hot zinc, or, if this is not at hand,



NOVEL SUBSTITUTE FOR A ROPE SPLICE

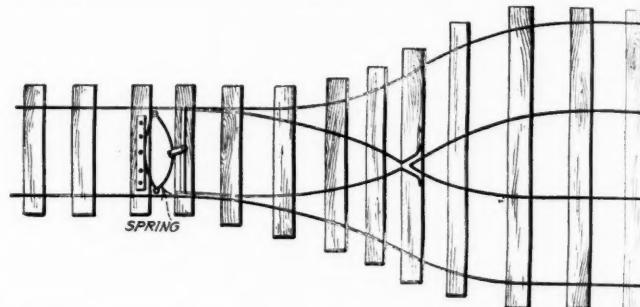
hard babbitt, through one of the drill holes, filling the entire sleeve. When cool the splice is complete and ready for use.

Of course the sleeve and cable should be thoroughly dry before the zinc or babbitt is poured. A splice of this kind has the decided advantage that it requires less cable than does a regular rope splice. It is however entirely unsuited to passing around pulleys or sheaves.

Automatic Spring Switch Throw

BY J. A. SMITH
Albert, W. Va.

The accompanying illustration shows an automatic spring throw for switch points on the lower end of the passing place on a gravity inclined plane. The spring and the connecting piece from it to the bridle



SWITCH THROW FOR LOWER END OF PASSING PLACE ON A GRAVITY INCLINED PLANE

hold the switch points securely against the rail. A loaded trip coming down the plane forces the points over, depressing the spring until the connecting piece is past the center line of the track. Then the spring rebounds and holds the switch points against the other rail. Thus the switch is always in proper position for the ascending trip, with the switch points resting securely against the rails.

Charging Rack for Edison Batteries

BY FRANK HUSKINSON
Lafayette, Colo.

A company with which I was connected decided to put in a lot of the Edison electric safety mine lamps. Not having any storage battery charging facilities at the mine it was necessary to build a suitable charging rack.

Having noticed some crude and unsatisfactory charging racks at some of the neighboring mines, I decided to build a first-class and convenient one, to take care of the Edison portable batteries. In this I had the hearty coöperation of the mine superintendent. I constructed a 200-battery rack which was automatic in operation; that is, 100 or 200 batteries could be charged on it without difficulty. The rack took up a small amount of space and was both convenient and ornamental.

In Fig. 1 is shown the details of the top contact board. In making up these boards I used clear Oregon pine, $1 \times 2 \times 16$ in. These boards were all given two coats of shellac varnish before attaching the parts to them. The contact plates on the bottom part of this board are pieces of brass angle, $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{16} \times 3$ in. These pieces are spaced $3\frac{1}{2}$ in. apart and are fastened to the board with $\frac{1}{4}$ -in. wood screws. On the top side of the board are placed pieces of brass strip, $\frac{3}{4} \times \frac{1}{16} \times 3$ in.

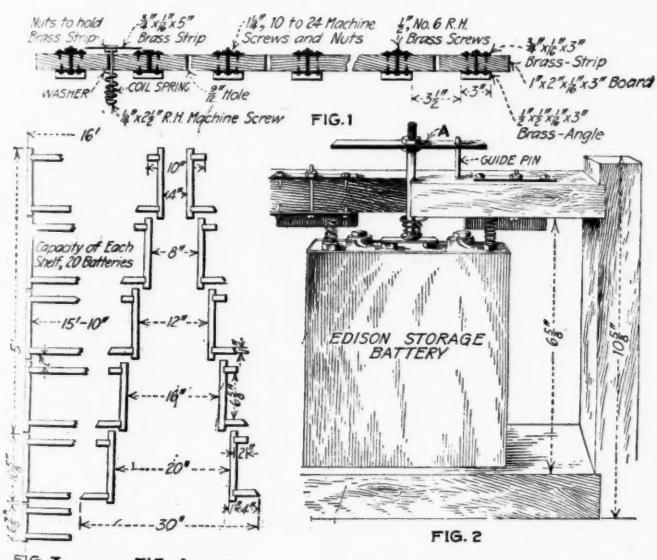
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These pieces are spaced the same as the brass angle pieces and are bolted to the latter by a 10-24 x 1½-in. machine screw. In the center of the space between the brass angle piece and strip there is a $\frac{9}{32}$ -in. hole bored in the board. A $\frac{1}{4}$ x 2½ in. machine screw passes through this hole. On the bottom part of this screw is a coil spring and a washer. On the top side is fastened the brass plate A (Fig. 3) or strip, $\frac{3}{16}$ x $\frac{1}{16}$ x 5 in. The object of this brass plate is to close the circuit across the brass angle and strip pieces, on either side. When the batteries are removed, the coil spring holds this brass plate in contact with the brass strips on either side. These strips are in electrical contact with the brass angle pieces through the 10-24 x 1½-in. machine screws. The movable brass strip on top is held from moving out of place by the guide pin.

In Fig. 2 is shown a detail of the movable strip, etc., while Fig. 3 shows the action of the rack. When inserting a battery receptacle the head of the large machine screw comes in contact with the cross-connector on the Edison battery, and at almost the same time the contact springs on the battery come in contact with the brass angle pieces on each side. The battery is pushed up into place, and the large machine screw is forced upward. This screw, with the brass strip attached to the other end, is pushed up far enough so that the brass strip clears the brass pieces on each side. This opens the circuit at this point and allows the current to pass through the accumulator by means of the brass angle pieces and the contact springs on the battery. The back board of the rack is spaced 1 in. from the center of the brass angle pieces, so that the batteries are in proper place whenever they are pushed up in the rack as far as they will go. It only takes a second to insert



FIGS. 1 TO 4. DETAILS OF A RACK FOR CHARGING EDISON SAFETY MINE LAMPS

or remove a battery from this rack. There is no changing or making of electrical connections.

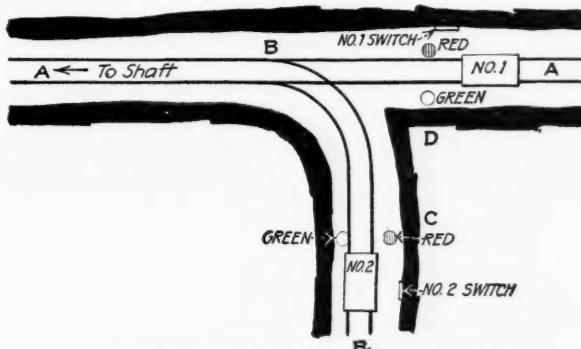
In Fig. 4 is shown a front view of the charging rack. This is built in sections which are assembled and spaced as shown in Fig. 1. The dimensions given in Fig. 4 allow for 20 batteries for each section. The completed rack contains 10 sections, making a rack that will take care of 200 batteries or of only one battery if desired.

In Fig. 1 is shown a detailed end view of this rack with all dimensions. When completely assembled the charging rack takes up a space 16 ft. long by 2½ ft. wide and a total height of 5 ft. All of the woodwork is treated to at least two coats of shellac varnish, giving it a pleasing and durable finish and one that is easily kept clean.

Signal Lights at Entry Junctions

BY O. H. HAMPSCH
Washington, D. C.

Considerable annoyance and confusion of signals are frequently created at entry junctions where two or more motors use the same main entry to the shaft. This often results in loss of time through accidents. A simple



AN EFFECTIVE SIGNALING SYSTEM

and effective arrangement (employing red and green incandescent lights on each entry) whereby each motorman knows the relative position of the other is shown in the accompanying drawing.

An alternate switch (marked 1) on entry AA is used by the motorman operating No. 1 motor. Throwing this switch forward lights the red light at C when going out, and reversing it upon returning, lights the green light at C. The motorman operating No. 2 motor then knows before entering the entry AA whether No. 1 motor is in or out, and if the track is clear, by the kind of signal shown.

The red and green lights at D are operated by No. 2 motorman from switch 2 upon passing in or out of entry BB, thus giving his relative position to No. 1 motorman. The lights can be controlled by an alternate switch so located as not to inconvenience the motorman in operating it from his locomotive.

This forms a simple and effective signal that can be read at a distance and can be installed by the mine electrician with small expense of time and money.

Watts per Cubic Foot Required To Heat a Room

BY R. G. FLAVIUS

Experiments indicate that, for average conditions, a power expenditure of 1½ to 2 watts per cubic foot of air space will heat a room satisfactorily. For example, what wattage would be required to heat a room 10 x 12 x 9 ft.? The cubical contents of this room would be $9 \times 10 \times 12 = 1080$ cu.ft. Hence, the wattage required would be (assuming an expenditure of 2 watts per cu.ft.) 2160 watts; that is, 2.2 kw., or about 2.9 horsepower.

Recent Dwelling Construction in Pennsylvania

BY DEVER C. ASHMEAD
Tarrytown, N. Y.

SYNOPSIS—*Tile bungalows at Rossiter, Penn. Two-story tile houses at Clymer, Penn. Single-family framehouses at Coal Run, Penn., capable, with some small changes, of being used for either a miner's or a superintendent's house. Two-family houses at Coal Run, Penn. Some illustrations of houses at Ebensburg, Penn. Bills of materials and working drawings for the first four houses.*

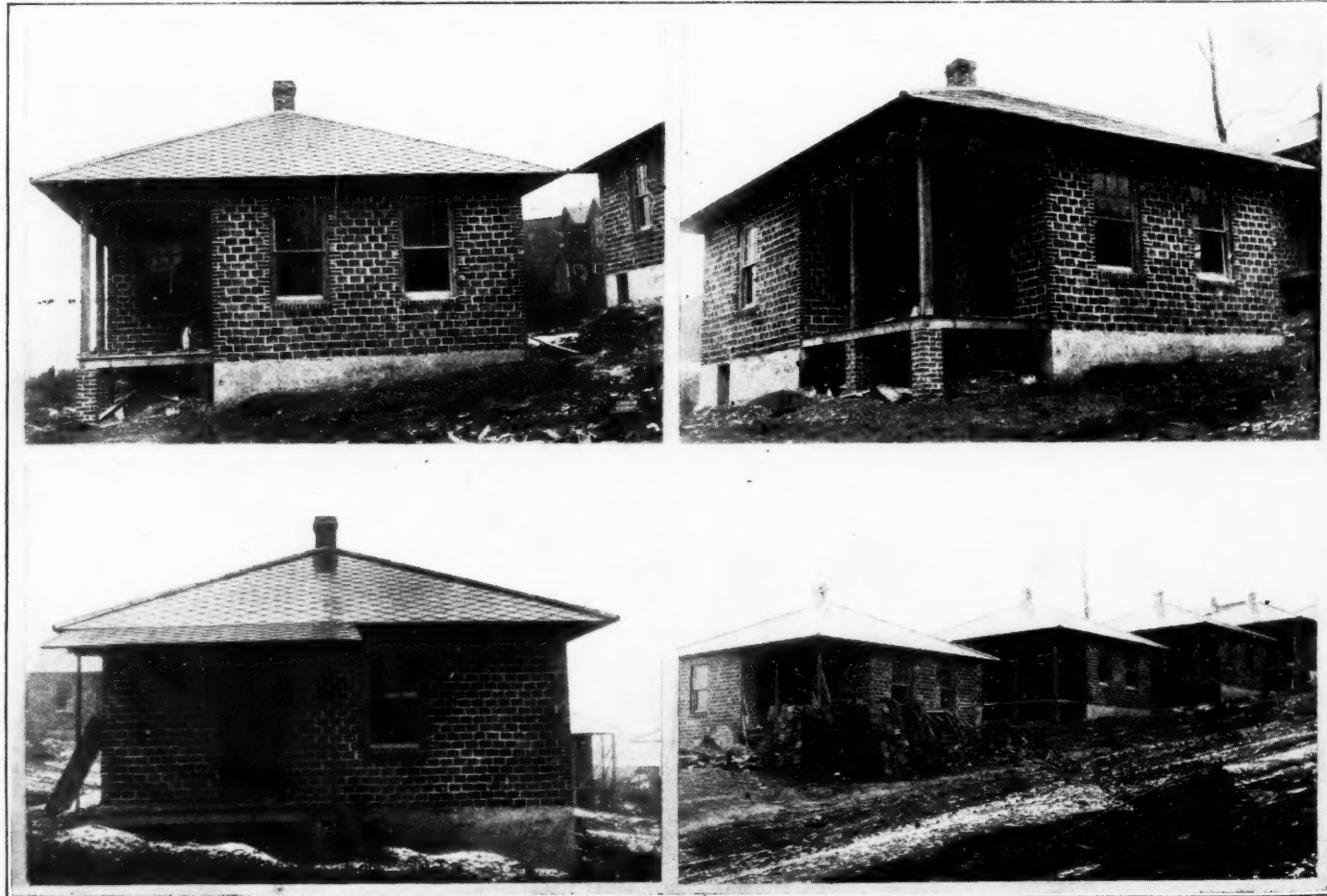
A NUMBER of houses of new design, of which this article covers only a few, have been erected in Indiana County, Pennsylvania, during the last few years. The Clearfield Bituminous Coal Corporation seems to have concentrated all its efforts in the erection of tile dwelling houses, of which it has two distinct types—a small three-room bungalow and a six-room two-story dwelling.

The bungalows, illustrated in Figs. 1, 2, 3 and 4, and shown in working drawing in Fig. 5, are being built at the Rossiter mine. Seventy-two of these are now either partly or wholly finished. These bungalows have over-all dimensions of 24 x 28 ft. They contain a front porch 7 x 12 ft., a living room 12 ft. by 15 ft. 6 in.,

a bedroom 11 x 14 ft., and a kitchen 11 x 14 ft. The houses are well lighted both by night and by day. They have three windows in each room. Each room has an electric light as has also the front and back porch. The kitchen door opens on a back porch 6 x 12 ft. Running water is provided in the kitchen. The rooms are heated by coal stoves furnished by the tenants. The use of tile in the construction of these houses tends to keep them cool in summer and warm in winter.

At the Sample Run mine of the Clearfield Bituminous Coal Corporation, at Clymer, Indiana County, Pennsylvania, the second type of house already mentioned is being used. This house is built of tile, is two stories in height and contains six rooms—three upstairs and three down. The house is not so attractive as the bungalow, but it is much better adapted to the needs of large families. These houses have a small front and back porch.

The front door opens into a large living room 10 ft. 6 in. by 17 ft. 6 in. To the rear of this is either a dining room or bedroom 9 ft. by 14 ft. 6 in. and also a kitchen 11 ft. 6 in. No running water has been provided within the houses. Upstairs there are bedrooms and a small hall. The front bedroom is 10 ft. 6 in. by 17 ft. 6 in. and has an angle closet in the



FIGS. 1 TO 4. VIEWS OF THE TYPE OF BUNGALOW BEING BUILT AT THE ROSSITER MINE

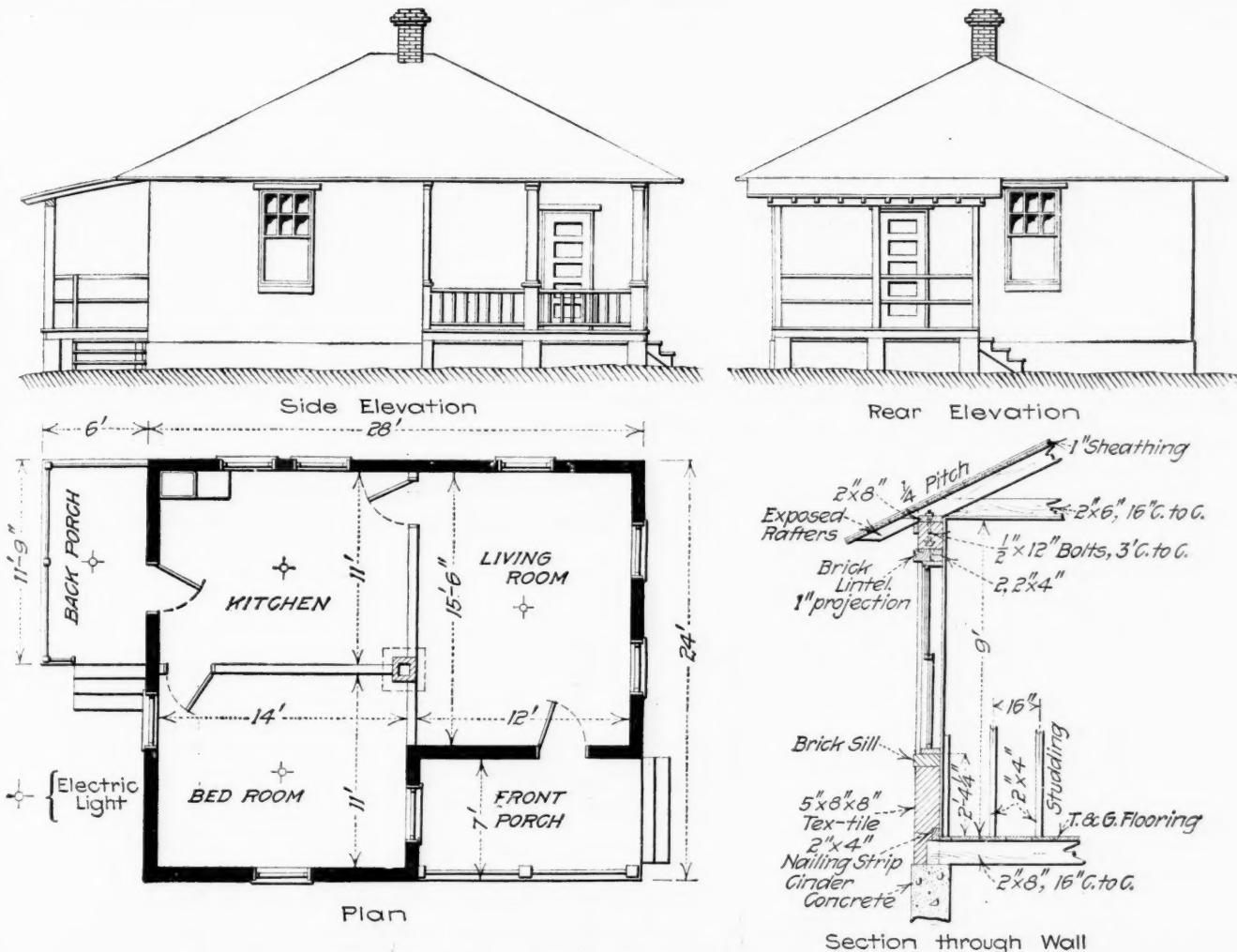


FIG. 5. WORKING PLAN OF BUNGALOWS ILLUSTRATED IN FIGS. 1 TO 4

rear. The bedrooms are 14 ft. 6 in. by 9 ft. 9 in. and 11 ft. 3 in. by 10 ft. 3 in. The chimney is in the center of the house. The roof is covered with Johns-Manville asbestos sheet roofing. The details of construction are shown in Fig. 6.

The following bill of material is approximately correct. In fact the amounts are slightly in excess of what would probably be required.

BILL OF MATERIAL, THREE-ROOM BUNGALOW, CLEARFIELD BITUMINOUS COAL CORPORATION, ROSSITER, PENN.

Finished Lumber	
2 outside doors, 2 ft. 8 in. by 6 ft. 8 in. by 1½ in.	5 panels
2 inside doors, 2 ft. 6 in. by 6 ft. 8 in. by 1½ in.	5 panels
8 windows, two sash to window, one 30 x 28-in. light in lower sash and six 10 x 14 in. lights in upper sash glazed	
8 window frames for above sash	
2 outside doorframes	
2 inside doorframes	

	Board Feet
3 pieces, 1 x 4 in., by 12 ft., stools	12
3 pieces, 1 x 4 in., by 12 ft., aprons	12
8 pieces, 1 x 4 in., by 12 ft., window casin	32
4 pieces, 1 x 4 in., by 8 ft., window casin	11
6 pieces, 1 x 4 in., by 14 ft., door casing	28
2 pieces, 1 x 4 in., by 12 ft., door casing	8
160 lin. ft., 1 x 8 in., base board	107
9 pieces, 1 x 8 in., by 12 ft., border board	72
2 pieces, 1 x 4 in., by 10 ft., front porch post	7
4 pieces, 1 x 8 in., by 10 ft., front porch post	27
5 pieces, 1 x 6 in., by 10 ft., front porch post	25
2 pieces, 1 x 8 in., by 12 ft., front porch post	16
2 pieces, 1 x 10 in., by 12 ft., front porch post	20
2 pieces, 5 x 5 in., by 14 ft., front porch	29
1 pieces, 1 x 6 in., by 14 ft., front porch	4
1 piece, 1 x 6 in., by 8 ft., front porch	4
2 pieces, 2 x 4 in., by 12 ft., front porch railing	16
36 lin. ft., 2 x 2 in., front porch balusters	12
4 porch posts, 5 x 5 in., by 8 ft., back porch	50
4 pieces, 1 x 6 in., by 12 ft., back porch	24
2 pieces, 5 x 5 in., by 12 ft., back porch	50
4 pieces, 2 x 4 in., by 12 ft., back porch railing	32
14 pieces, 2 x 4 in., by 10 ft., back porch rafters	93
160 lin. ft., 1 x 2 in., nailing strip	27
Total	728

Rough Lumber	
60 pieces, 2 x 6 in., by 16 ft., roof rafters	960
9 pieces, 2 x 6 in., by 12 ft., back porch joists	108
9 pieces, 2 x 6 in., by 14 ft., front porch joists	126
1 piece, 3 x 6 in., by 10 ft., front porch posts	15
2 pieces, 6 x 6 in., by 10 ft., front porch posts	60
16 pieces, 2 x 8 in., by 14 ft., floor joists and sills	299
30 pieces, 2 x 8 in., by 12 ft., floor joists and sills	480
14 pieces, 2 x 6 in., by 14 ft., ceiling joists	196
26 pieces, 2 x 6 in., by 12 ft., ceiling joists	312
11 pieces, 2 x 6 in., by 8 ft., ceiling joists, porch	88
34 pieces, 2 x 4 in., by 10 ft., studding	227
1,200 sq.ft., 1 x 8 in., and 10 in., sheathing	1,200
9 pieces, 2 x 8 in., by 12 ft., wall plates	144
15 pieces, 2 x 4 in., by 12 ft., window and door caps	120
700 sq.ft. tongue and groove, 1 in. flooring	875
100 sq.ft., tongue and groove, 1-in. flooring, front porch ceiling	125
300 lin.ft., 1 x 2 in., bridging	50
3 pieces, 2 x 12 in., by 6 ft., front steps	36
3 pieces, 2 x 12 in., by 12 ft., back steps	72
80 pieces, 1 x 2 in., by 10 ft., facing	133
3,000 4-ft. spruce laths	
4 pieces, 2 x 6 in., by 18-ft. ridge pole	72
Total	5,698
Grand total	6,701

Brick Tile, Etc.
2,100—5 x 8 in., by 8 in. tile
450—4 x 5 in., by 8 in. split tile
1,500—standard size trimming brick
500—standard size chimney brick
1,150—sq.ft. of roofing
200—sq.yd. of plaster
Estimates for foundations are not included

A rather interesting type of single house is being built by the Coal Run Coal Co. at Coal Run, Penn. This house is entirely frame, is two stories in height and is covered with Johns-Manville Brooks brand roofing. The house has a front porch 6 x 16 ft. and a smaller back porch. There are six rooms and bath in the house and a cellar excavated under the entire dwelling. Fig. 7 shows the details of construction while Fig. 8 shows the houses under construction.

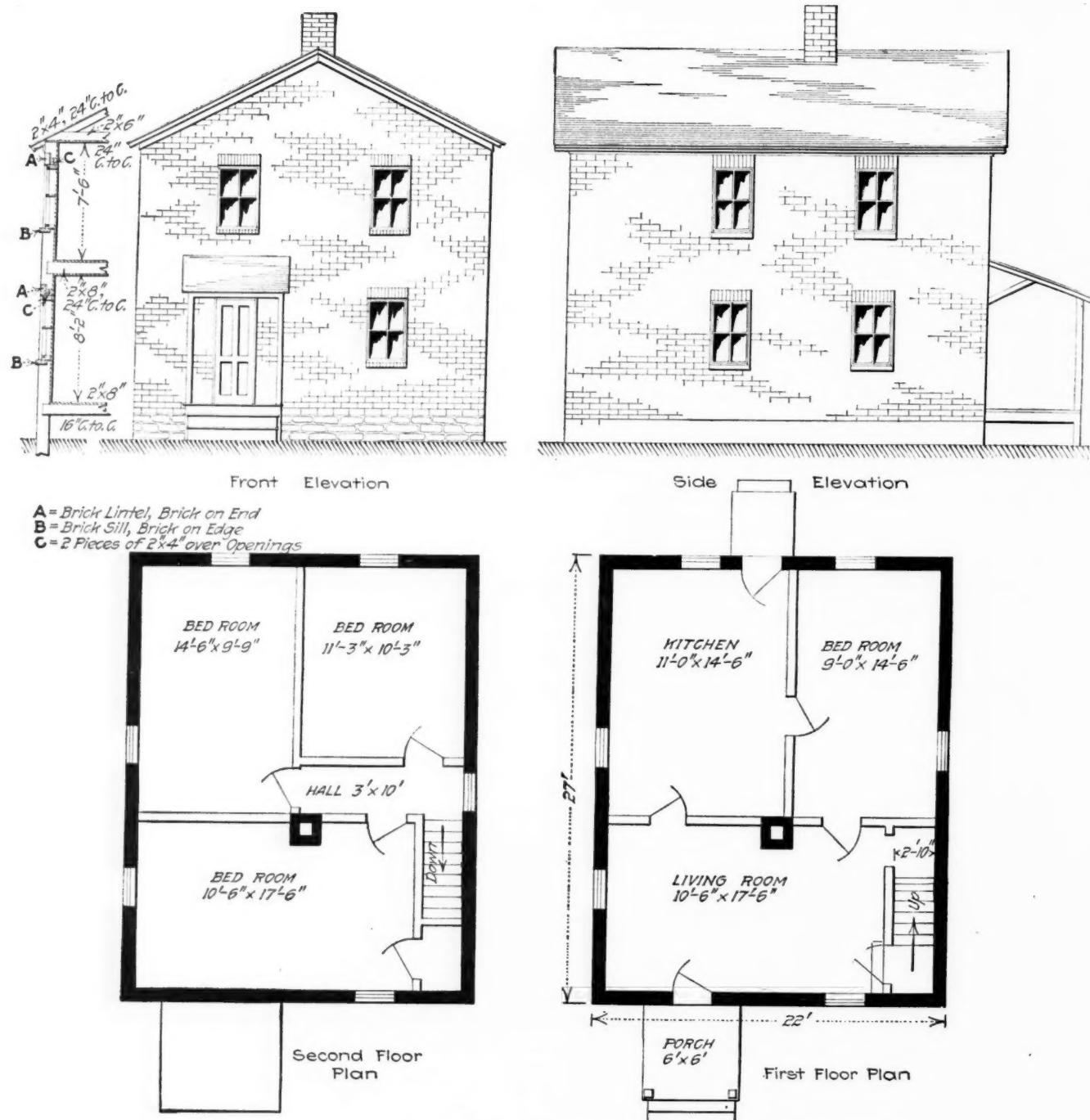


FIG. 6—DETAILS OF CONSTRUCTION OF TWO-STORY, SIX-ROOM TILE HOUSE

BILL OF MATERIAL FOR SIX-ROOM TWO-STORY HOUSE CLEARFIELD BITUMINOUS COAL CORPORATION, ROSSITER, PENN.

Finished Lumber

2 inside doors, 2 ft. by 6 ft. 6 in.
 2 outside doors, 2 ft. 8 in., by 6 ft. 8 in., by 1 $\frac{1}{2}$ in.
 7 inside doors, 2 ft. 6 in., by 6 ft. 6 in., by 1 $\frac{1}{2}$ in.
 13 windows, 2 sash to the window, two 12 x 22 in. lights to sash
 13 window frames for above sash
 2 outside door frames
 9 inside door frames

20 lin.ft. $\frac{1}{2} \times 3\frac{1}{2}$ in., net facing windows
 4 pieces, 1×4 in., by 12 ft., stools
 4 pieces, 1×4 in., by 12 ft., aprons
 13 pieces, 1×4 in., by 13 ft., window casing
 6 pieces, 1×4 in., by 12 ft., window casing
 400 lin.ft. $\frac{1}{2} \times 8$ in., base board
 400 lin.ft. $\frac{1}{2}$ in. quarter round molding
 4 pieces, 6 x 6 in., by 8 ft., front and back porch
 358 lin.ft., 1 x 2 in., nailing strip
 2 pieces, 2 x 10 in., by 14 ft., stringers
 4 pieces, $1\frac{1}{2} \times 9\frac{1}{2}$ in., by 12 ft., stair treads
 4 pieces, $1\frac{1}{2} \times 7\frac{1}{2}$ in., by 12 ft., stair rises
 3 pieces, 1 x 6 in., by 12 ft., front and back porch
 27 pieces, 1 x 4 in., by 14 ft., door casing

Board Feet

6
 16
 16
 60
 24
 260
 96
 9
 4
 2
 18
 121

Rough Lumber	
50 pieces, 2 x 6 in., by 12 ft., joists	600
50 pieces, 2 x 4 in., by 16 ft., roof rafters	533
23 pieces, 2 x 6 in., by 12 ft., 2nd floor ceiling joists	336
23 pieces, 2 x 8 in., by 12 ft., 2nd floor joists	448
40 pieces, 2 x 8 in., by 12 ft., 1st floor joists	640
2 pieces, 2 x 8 in., by 16 in., ridge pole	32
200 lin.ft., 2 x 8 in., cap for tile "D," Fig. 6	270
8 pieces, 2 x 4 in., by 12 ft., see "C," Fig. 6	64
1,200 sq.ft., 1 x 8 in., or 10 in., sheathing	1,200
1,400 sq.ft., tongue and groove $\frac{1}{2}$ in. flooring	1,750
200 sq.ft., tongue and groove, $\frac{1}{2}$ in. porch ceilings	262
6,400 4-ft. lath	739
72 pieces, 2 x 4 in., by 16 ft., studding	300
180 pieces, 1 x 2 in., by 10 ft., furring	100
600 lin.ft., 1 x 2 in., bridging	18
3 pieces, 2 x 12 in., by 6 ft., front steps	72
3 pieces, 2 x 12 in., by 12 ft., back steps	60
5 pieces, 2 x 6 in., by 12 ft., back and front porch joists	144
108 lin.ft., 2 x 8 in., wall plates	7,568
Total	8,387
Grand total	Brick, Tile, Etc.
3,750 5 x 8 in., by 12 in., tile	
250 4 x 4 in., by 12 in., tile	
600 5 x 4 in., by 8 in., tile	
800 common chimney brick	
400 sq.yd. plaster	

Estimates for foundations are not included

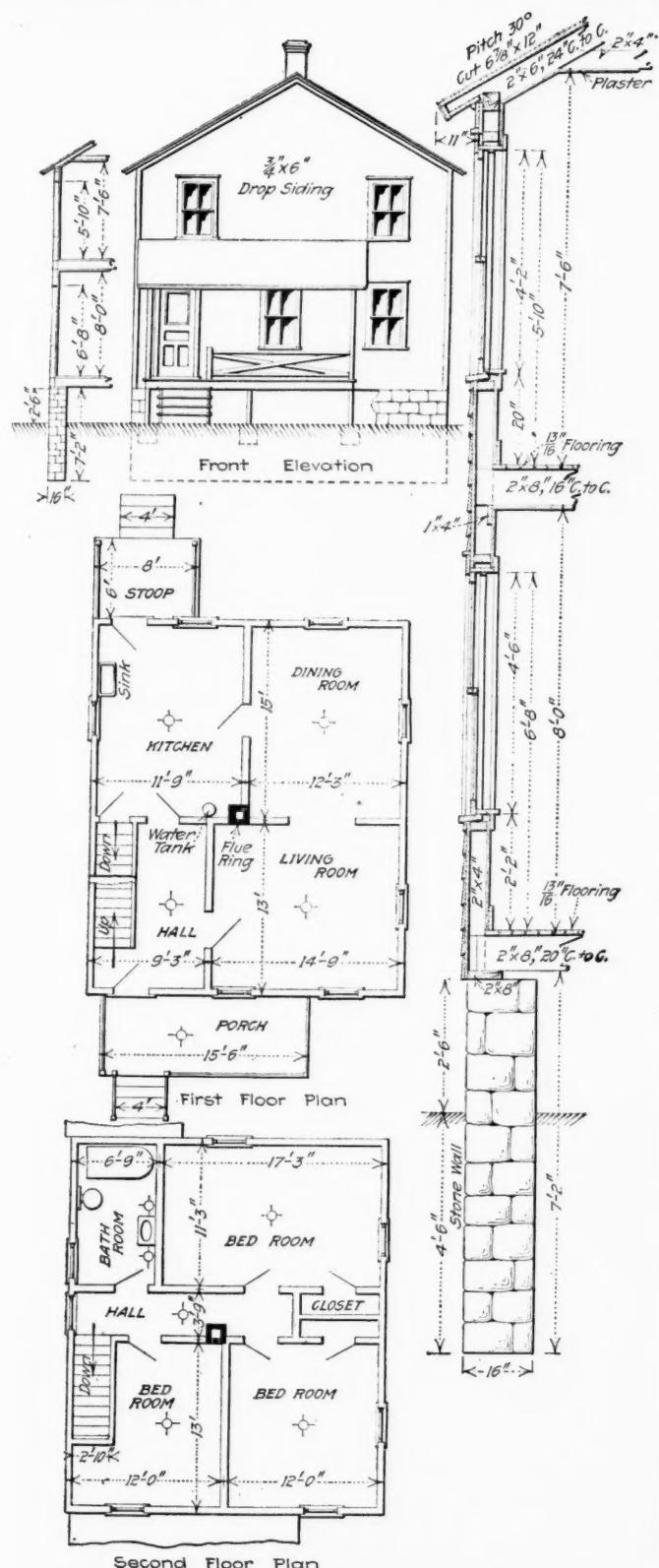


FIG. 7—DETAILS OF TWO-STORY SINGLE HOUSE

On the first floor is an entrance hall 9 ft. 3 in. by 13 ft., in which the stairway is located. There are two doors from this hall, one into a well-lighted living room which measures 13 ft. by 14 ft. 9 in. The other door from the hall opens into a kitchen 15 ft. by 11 ft. 9 in., provided with hot and cold water. A door from the kitchen opens into the dining room, and a large double door connects this latter room with the living room, which room measures 12 ft. 3 in. by 15 feet.

Upstairs there are three bedrooms, a hall and a bathroom. Two of these bedrooms are across the front of

the house and have the same dimensions—namely, 12 x 13 ft. In the rear of the house there is one large bedroom measuring 11 ft. 3 in. by 17 ft. 3 in. The bathroom is of ample size—6 ft. 9 in. by 11 ft. 3 in. Between the back bedroom and the two front bedrooms is a hall 3 ft. 9 in. wide. At the end of this hall are two closets.

An exceedingly interesting feature in this design is the ease with which the house can be converted either into a superintendent's house or into a residence for the mine foreman. To prepare for the latter all that is necessary is to change the front porch by adding turned balustrades. For a superintendent's house about eight changes are necessary: (1) Use shingles, instead of drop siding, on the roof gables. (2) Use asbestos shingles on the roof. (3) Use large posts and turned balustrades on the porches and lattice the spaces below the porch floor. (4) Use a two-light instead of a four-light window. (5) Provide a steam-heating plant. (6) Cut a cellar door in the foundations so as to give an outside entrance. (7) Replace the closet space on the second floor by a bathroom; then convert the space in the rear of the house into two bedrooms of equal size, thus giving the house seven rooms and a bath. (8) Decorate the inside of the house to accord with its more elaborate construction. The bill of material is shown in the table on the next page.

At its Coal Run mines, Coal Run, Penn., the Coal Run Coal Co. has erected for its miners 72 double houses of two-story construction and is proposing to build many more in the spring. These double houses

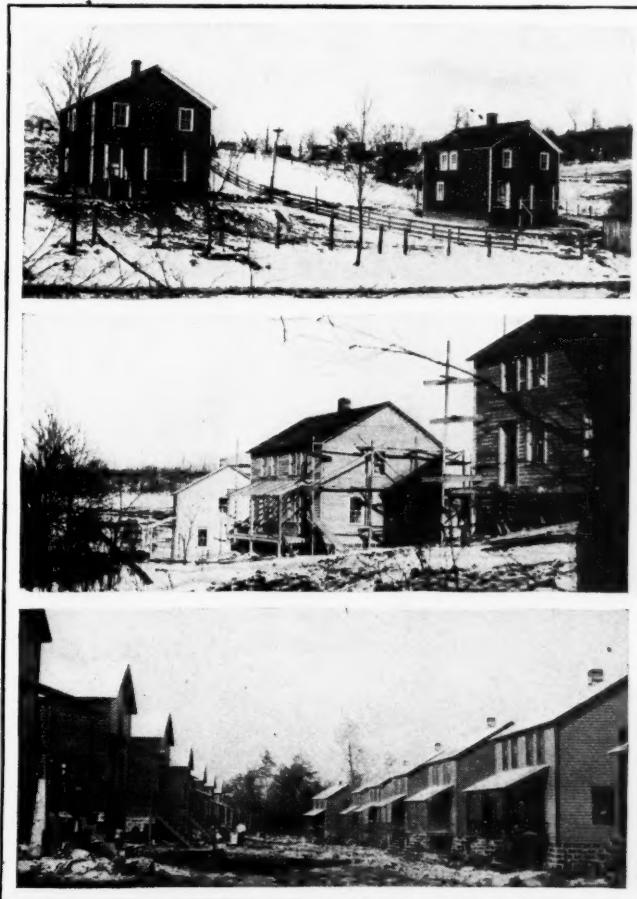


FIG. 8—HOUSES IN PROCESS OF CONSTRUCTION

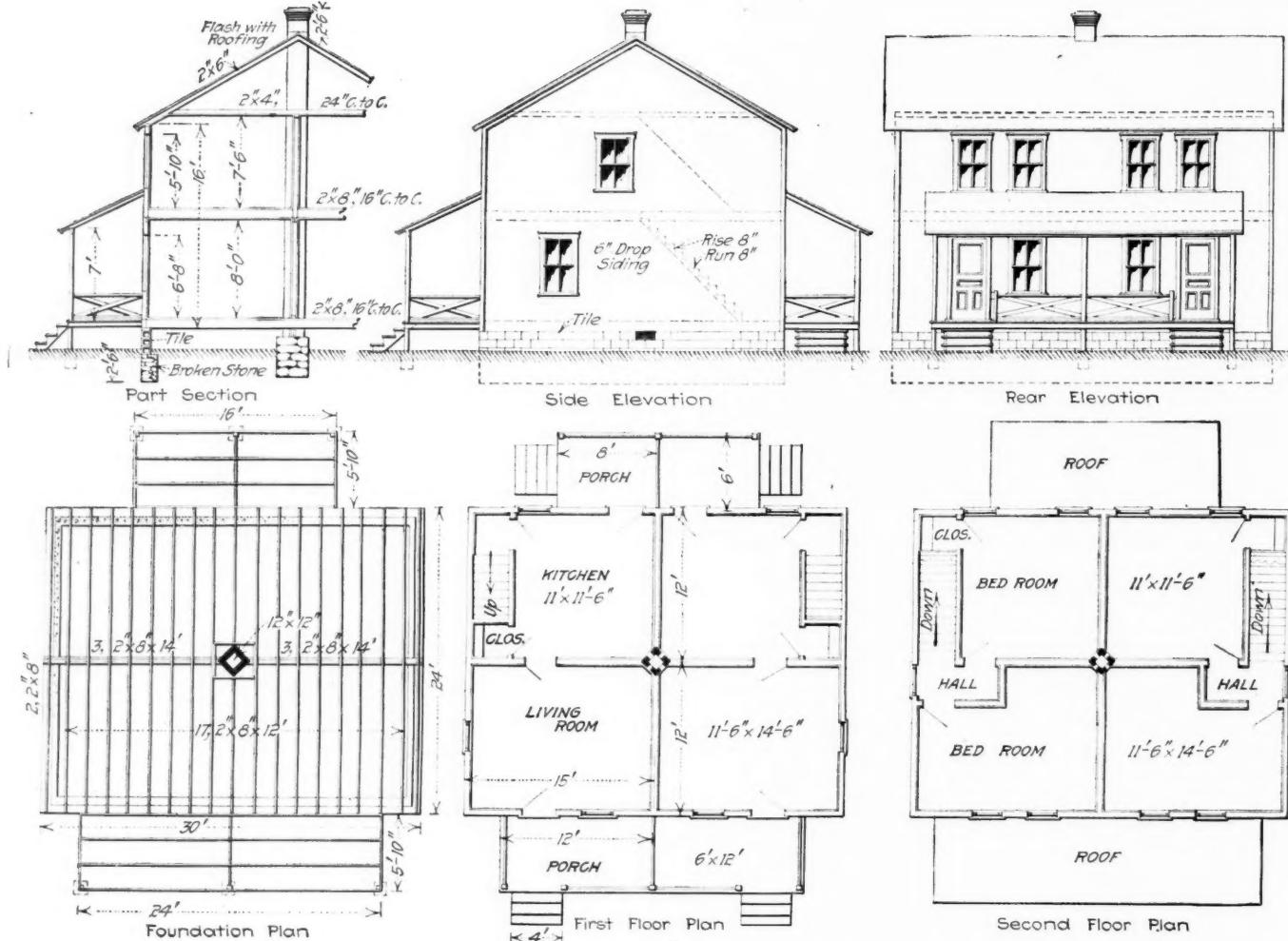


FIG. 9—DETAILED DRAWING OF DOUBLE HOUSES BUILT AT COAL RUN, PENN.

are neat and attractive in design. They are constructed of wood and painted a dark gray. The roof is covered with Johns-Manville Brooks brand roofing. There is

BILL OF MATERIAL FOR SINGLE HOUSE COAL RUN COAL CO., COAL RUN, PENN.

Finished Lumber

1 outside door, 2 ft. 8 in., by 6 ft. 8 in., by 11 in.	5 panels
1 outside door, 2 ft. 8 in., by 6 ft. 8 in., by 11 in.	Glazed
1 inside door, 2 ft. 8 in., by 6 ft. 8 in., by 11 in.	5 panels
6 inside doors, 2 ft. 8 in., by 6 ft. 8 in., by 11 in.	5 panels
3 inside doors, 2 ft. 8 in., by 6 ft. 8 in., by 11 in.	3 panels
7 windows, 2 sash to the window, 12 x 24 in.	2 lights to sash
7 windows, 2 sash to the window, 12 x 22 in.	2 lights to sash
4 windows, 1 sash to the window, 12 x 24 in.	2 lights to sash
7 frames for 12 x 24 in., 2 lights	2 sash to window
7 frames for 12 x 24 in., 2 lights	2 sash to window
4 frames for 12 x 24 in., 1 light	2 sash to window

Rough Timber	
2 pieces, 2 x 8 in., by 16 ft., ridge poles	42
3½ pieces, 2 x 6 in., by 16 ft., roof rafters	512
32 pieces, 2 x 4 in., by 12 ft., ceiling hoists	256
42 pieces, 2 x 8 in., by 12 ft., 2nd floor	672
36 pieces, 2 x 8 in., by 12 ft., 1st floor	576
6 pieces, 2 x 12 in., by 14 ft., girder	168
188 pieces, 2 x 4 in., by 16 ft., studding	1,880
954 lin.ft., 1 x 2 in., bridging	160
1,100 sq.ft., 1 x 8 in., or 10 in., sheeting	1,900
9,000 lath, 4 ft.	1,100
1,344 sq.ft., 1½ tongue and groove flooring	1,680
144 sq.ft., ½ tongue and groove, porch flooring	180
144 sq.ft., ½ tongue and groove, porch ceiling	180
477 lin.ft., 2 x 4 in., wall plates	318
477 lin.ft., 2 x 8 in., joists	636
Total	10,260
Grand total	14,617

Board Feet	Miscellaneous
600 sq.yd. plaster	Bath room fixtures
1,100 sq.ft. roofing	Kitchen sink
1,200 common brick	

a front porch 6 x 24 ft., divided into two equal parts for each family. The back porch is 8 x 16 feet.

Each side of the house contains four rooms, two upstairs and two on the main floor. The front rooms up and downstairs are 11 ft. 6 in. by 14 ft. 6 in., and the two back rooms 11 ft. by 11 ft. 6 in. The stairway is located in the kitchen. At the head of the stairs is a small hall 3 x 6 ft. No running water or heat of any kind is provided within the house. The chimney is in the center of the house, and flues open into every room. Light and air are generously provided, there being two windows of ample size in each room. Fig. 10 is an illustration of these houses partly finished. Fig. 11 shows one of the rows in the village completed. Fig.

2 pieces, 1 x 6 in., by 12 ft., front and back porch	12
1 piece, 2 x 6 in., by 16 ft., front and back porch	16
1 piece, 1 x 6 in., by 16 ft., front and back porch posts	8
3 pieces 4 x 4 in., by 14 ft., front and back porch	56
1 piece, 4 x 4 in., by 10 ft., front and back porch	13
4 pieces, 1 x 2 in., by 12 ft., front and back porch	8
1 piece, 2 x 6 in., by 8 ft., front and back porch	4
2 pieces, 1 x 2 in., by 10 ft., front and back porch	5
4 pieces, 1 x 1 in., by 14 ft., front and back porch	70
7 pieces, 2 x 4 in., by 14 ft., front and back porch rafters	3
2 pieces, 1 x 2 in., by 8 ft., front and back porch	1
1 piece, 1 x 1 in., by 8 ft., front and back porch	28
7 pieces, 1 x 4 in., by 12 ft., stools	28
7 pieces, 1 x 4 in., by 12 ft., aprons, back porch	28
7 pieces, 1 x 4 in., by 8 ft., window casing	23
7 pieces, 1 x 4 in., by 8 ft., window casing	21
10 pieces, 1 x 4 in., by 12 ft., window casing	40
475 lin.ft., 1 x 8 in., base board	475
475 lin.ft., 2-in. quarter round, molding	80
475 lin.ft., 1 x 2 in., nailing strips	48
2 pieces, 2 x 10 in., by 14 ft., stringers	45
2 pieces, 1-in. quarter round, molding	32
9 pieces, 1 x 9½ in., by 6 ft., treads	108
9 pieces, 1 x 7½ in., by 6 ft., rises	3,225
12 pieces, 1 x 6 in., by 18 ft., corner trims	
3,900 lin.ft., 1 x 6 in., drop siding	
Total	4,357

9 is a detailed drawing of the same dwellings. The bill of material is only approximate:

BILL OF MATERIAL FOR DOUBLE MINERS HOUSE,
COAL RUN COAL CO., COAL RUN, PA.

	Board Feet
Finished Lumber	
4 outside doors, 2 ft. 8 in., by 6 ft. 8 in., by 13 in., glazed	64
8 inside doors, 2 ft. 6 in., by 6 ft. 6 in., by 1½ in.	52
4 inside doors, 2 ft. 6 in., by 6 ft. 6 in., by 1½ in.	16
8 windows, 2 sash to the window, 12 x 24 in.	2 lights
8 window frames for above	2 lights
10 windows, 2 sash to the window, 12 x 20 in.	10
10 window frames for above	10
12 pieces, 1 x 4 in., by 16 ft., outside trim.	42
3 pieces, 4 x 4 in., by 14 ft., porch posts.	16
1 piece, 2 x 6 in., by 16 ft., back porch.	24
2 pieces, 2 x 6 in., by 12 ft., front and back porch.	24
2 pieces, 2 x 4 in., by 16 ft., back porch.	22
2 pieces, 1 x 4 in., by 18 ft., back porch.	12
2 pieces, 2 x 4 in., by 14 ft., front porch.	18
2 pieces, 1 x 4 in., by 16 ft., front porch.	10
2 pieces, 2 x 4 in., by 12 ft., front porch.	16
2 pieces, 1 x 4 in., by 14 ft., front porch.	10
2 pieces, 2 x 6 in., by 12 ft., front porch.	24
1 piece, 2 x 6 in., by 16 ft., back porch.	16
9 pieces, 1 x 4 in., by 14 ft., aprons, porch.	42
9 pieces, 1 x 4 in., by 14 ft., stools, porch.	42
9 pieces, 1 x 4 in., by 14 ft., window casing.	42
18 pieces, 1 x 4 in., by 18 ft., window casing.	108
20 pieces, 1 x 4 in., by 14 ft., door casing.	140
500 lin.ft., 1 x 8 in., base board.	335
500 lin.ft., 3-in. quarter round, molding.	85
500 lin.ft., 1 x 2 in., nailing strips.	80
4 pieces, 2 x 10 in., by 12 ft., stringers.	60
6 pieces, 1½ x 9¾ in., by 12 ft. treads.	42
9 pieces, 1½ x 7½ in., by 12 ft. risers.	42
4,000 sq.ft., 6-in. drop-siding siding	3,000
Total	4,284
Rough Lumber	
2 pieces, 2 x 8 in., by 18 ft., ridge pole.	38
32 pieces, 2 x 6 in., by 18 ft., rafters.	576
32 pieces, 2 x 4 in., by 16 ft., ceiling joists.	160
46 pieces, 2 x 8 in., by 16 ft., 2nd floor joists.	966
40 pieces, 2 x 8 in., by 16 ft., 1st floor joists.	840
9 pieces, 2 x 8 in., by 12 ft., sills.	144
163 pieces, 2 x 4 in., by 16 ft., studding.	1,630
6 pieces, 2 x 8 in., by 14 ft., girder.	114
1,000 lin.ft., 1 x 2 in., bridging.	166
4,000 sq.ft., 1-in. sheeting side.	4,000
1,100 sq.ft., 1-in. sheeting roof.	1,100
9,000 laths, 4 ft., lath.	1,820
1,440 sq.ft., tongue and groove flooring.	309
240 sq.ft., tongue and groove, flooring porches.	333
240 lin.ft., tongue and groove, flooring porches, ceiling.	333
500 lin.ft., 2 x 4 in., wall plates.	130
13 pieces, 2 x 4 in., by 14 ft., rafters for porches.	12,527
Total	16,811
Grand Total	
Miscellaneous	
3,000 common brick	600 sq.yd. plaster
	1,100 sq.ft. roofing



FIGS. 10 AND 11.—UNCOMPLETED AND COMPLETED HOUSES

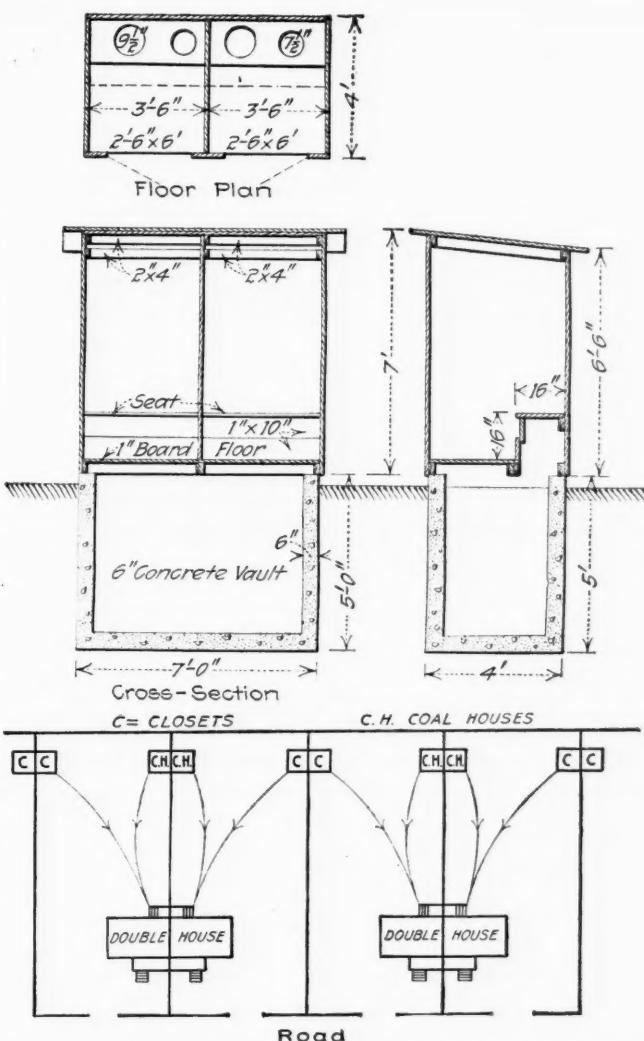


FIG. 12—ARRANGEMENT OF CLOSETS AND COAL HOUSES

The interesting arrangement of closets and coal houses is shown in Fig 12. It will be noticed that the coal houses are set nearer the dwellings than the closets. The following is a bill of material for the appurtenances, see Fig. 12:

BILL OF MATERIAL FOR CLOSETS, COAL RUN MINING CO.
Rough Lumber

	Board Feet
13 pieces, 1 x 12 in., by 14 ft.	182
4 pieces, 1 x 12 in., by 10 ft.	40
1 piece, 2 x 16 in., by 8 ft.	20
1 piece, 2 x 10 in., by 14 ft.	24
1 piece, 2 x 4 in., by 14 ft.	9
1 piece, 2 x 4 in., by 12 ft.	8
2 pieces, 2 x 4 in., by 18 ft.	12
140 cu.ft. excavation	25
54 cu.ft. concrete	
20 sq.ft. flooring	
28 sq.ft. roofing	
Total	310

BILL OF MATERIAL FOR COAL HOUSES, COAL RUN MINING CO.
Rough Lumber

	Board Feet
23 pieces, 1 x 12 in., by 14 ft.	322
4 pieces, 2 x 12 in., by 12 ft.	96
8 pieces, 2 x 4 in., by 12 ft.	64
Total	482

When the rate of combustion is doubled the quantity of the volatile matter distilled per unit of time is doubled. However, to burn this double quantity of volatile matter with the same excess of air to the same completeness, the combustion space is increased only about 20 per cent.—Bureau of Mines Bulletin No. 135.

The Ross Meridiograph

BY J. T. BEARD

Senior Associate Editor "Coal Age"

SYNOPSIS—Need of a simple means of making a quick and accurate determination of the true meridian at any suitable time and place. The "meridiograph" devised for this purpose. Description of the instrument, its use explained. Diagram for ascertaining at a glance the actual change in declination from that given in the Ephemeris for Greenwich noon, to that for any suitable time and place of observation at any longitude east or west of Greenwich.

IT IS a rare privilege to be able to present to the readers of *Coal Age* the description of a successful practical device whose need has long been felt by mining and civil engineers and surveyors, but which has heretofore defied many ingenious attempts to construct in a simple and compact manner.

All engineers and surveyors realize that the quick and ready determination of the true meridian of a place is

true north and has been used very largely by engineers and deputy mineral surveyors throughout the country. The delicacy of the adjustment of this device, however, required a degree of mechanical skill that few possessed; and this fact, together with the added expense of the attachment, is fast rendering its use obsolete in present-day practice.

The meridiograph is a new instrument, designed by Louis Ross, a former United States deputy mineral surveyor of San Francisco. Mr. Ross is to be congratulated on his mechanical ingenuity and the success that has attended his efforts. With the aid of this device, the engineer or surveyor is enabled to locate a true north and south line, in a few minutes, at any time of the day when an observation of the sun for this purpose is practicable.

As in the use of the solar attachment, the observation with the meridiograph will give the best results when made in the early morning or late in the afternoon, at which time the sun's altitude is changing more rapidly. An observation for azimuth taken in the hours approaching or following noonday are naturally unreliable. Observing the sun's altitude at noon, or when it is crossing the meridian, serves to determine the latitude of the place when this is not known. The altitude of the sun at noon is always the co-latitude of the place.

The accompanying illustration (Fig. 1) shows an observation taken at the crossroads at *O*, in the center of a landscape. The hour circle, or path of the sun, is described in a plane corresponding to the sun's declination at the time the observation is taken. The meridian to be determined is indicated, in the figure, by the line *NS*, which is the center line of the north and south road, in the landscape. The line *EW* represents the east and west line and is the center line of the crossroad, also shown in the figure.

At the moment of observation, the altitude of the sun, as measured by the transit at *O* is the angle *aOb*. The bearing of the sun, or its angular distance from the meridian *NS*, is indicated by the angle *aOS*. This angle is read on the meridiograph when the latitude of the place and the sun's altitude are set to correspond to each other on the respective scales of the instrument.

The manner of finding this angle of the sun's bearing, by means of the meridiograph, will be described later, but it may be stated here that the latitude of the place, if not previously known, may be ascertained from the co-latitude, indicated by the angle *mOn*, in the figure. This angle is measured by the transit when the sun has

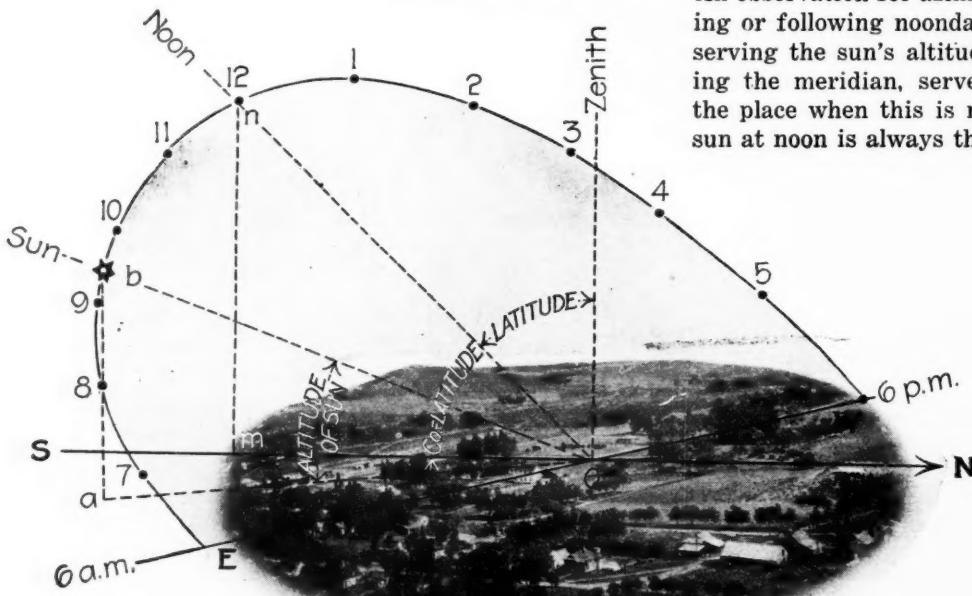


FIG. 1. ILLUSTRATING THE USE OF THE MERIDIOPHOTOGRAPH IN THE FIELD

not only a matter of first importance but is, at the same time, a most troublesome feature of the work in hand. As is well known, the indications of the magnetic needle are wholly unreliable. Astronomic methods for determining the true north are not only inconvenient and difficult, but require more knowledge of the heavens than is possessed by the average mine foreman. Such determinations are rarely attempted, even by the more skilled United States deputy mineral surveyors, the accuracy of whose work depends on the correct determination of the true meridian.

The so-called "solar attachment" of the engineer's transit has served the purpose till now of determining

attained its greatest altitude at noon when crossing the meridian. The latitude of the place is always the complement of the co-latitude, or 90 deg. minus the co-latitude. As indicated in the figure, the latitude is the angular distance of the sun at noon from the zenith.

The meridiograph instrument is shown in Fig. 2. It consists of two graduated disks and a reading arm equipped with a magnifying glass adjustable to any

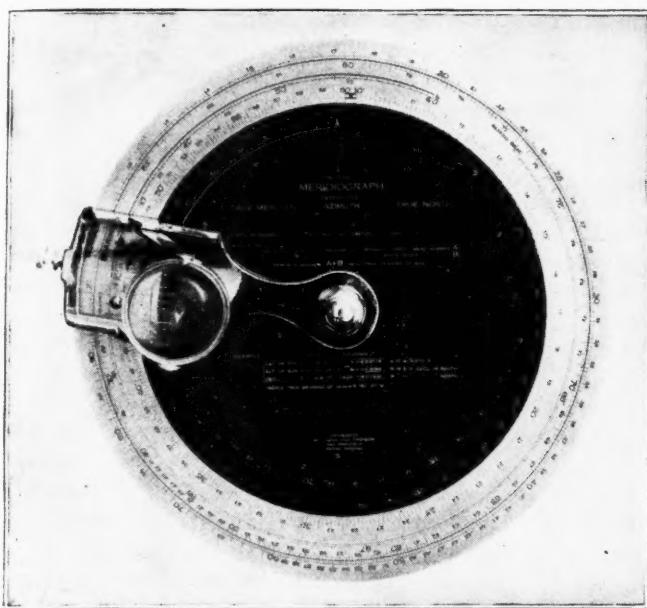


FIG. 2. THE MERIDIOGRAPH

focus. The two circular disks are concentric, the outer graduated circle having a diameter of 7 in. This scale is engraved on a silvered surface, while the inner dial is finished in gunmetal. The arrangement of the scales is

such that, although the diameter of the graduated circle does not exceed 7 in., the angular graduations are as open as a protractor 60 in. in diameter.

One has but to use the meridiograph once or twice, in the field, for the purpose for which it was intended, to be convinced of its practical value as a time saver and a guarantee against casual error in calculations. None realizes this better than the engineer who is familiar with common practice in the use of a solar.

There are several scales on the two disks of the meridigraph, the principal ones being known as the A scales, of which there are two, and the B scales, the same in number. There is, beside, a scale for determining sun time, by observation, if desired.

MANNER OF USING THE MERIDIOGRAPH IN THE FIELD

Briefly described, the operation of the meridiograph depends on two steps, assuming that the latitude and longitude of the place are known and that the sun's altitude has been measured with the transit, the first step is to ascertain the declination of the sun at the time of observation. The Ephemeris, or Nautical Almanac, used by engineers and surveyors, gives the sun's declination for each year, at Greenwich mean moon.

An inspection of the Ephemeris shows that the sun attains its greatest declination ($23^{\circ} 27'$) twice a year; namely, at the solstices, about June 21 and Dec. 21, the declination being north in the former case and south in the latter. Again, the declination of the sun is zero when crossing the equator, which is twice a year; namely, at the equinoxes, about Mar. 21 and Sept. 22.

Further inspection of the Ephemeris shows that the daily change in declination is greatest at the equinoxes when it is approximately 23.7 min. in 24 hr. At the solstices when the sun attains its greatest declination

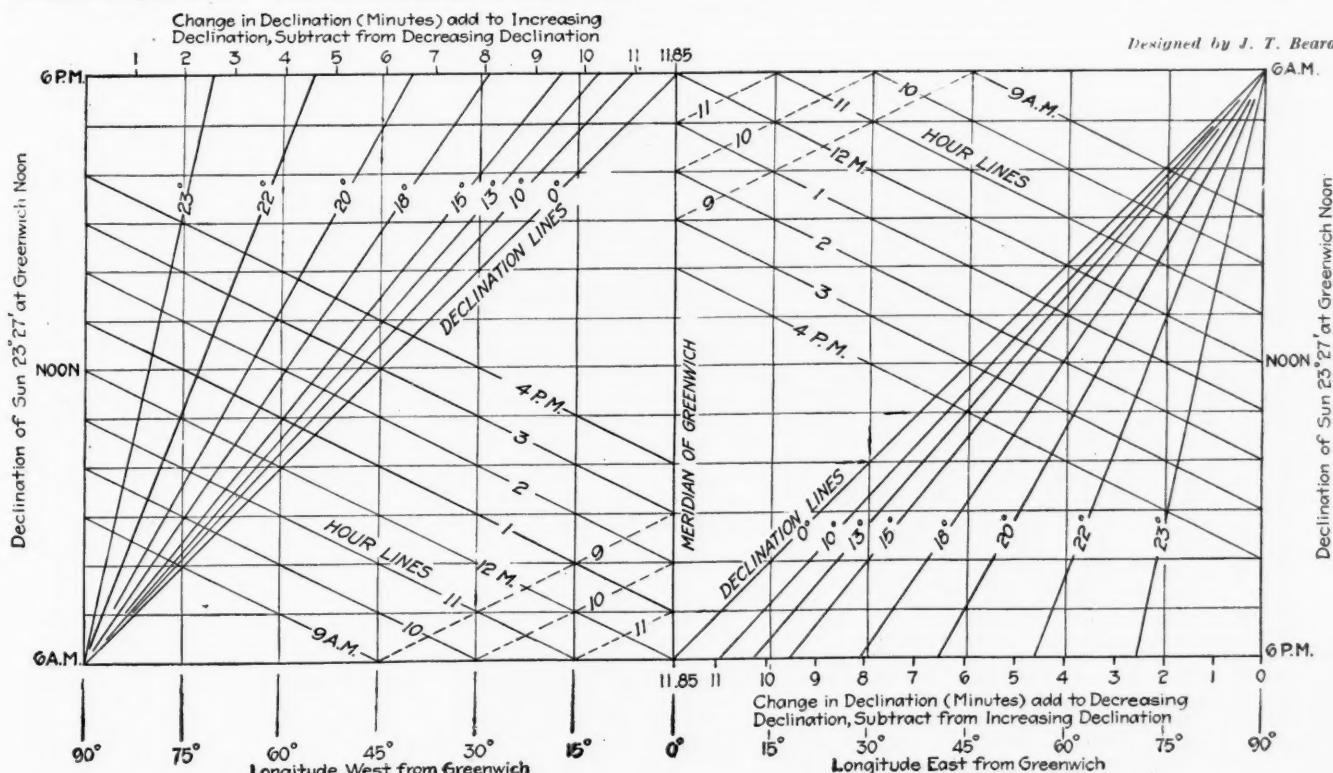


FIG. 3. DIAGRAM FOR ESTIMATING THE APPARENT DECLINATION OF THE SUN, FOR ANY LONGITUDE AND TIME FROM 9 A.M. TO 4 P.M., BY ADDING OR SUBTRACTING THE CHANGE TAKEN FROM THE DIAGRAM TO OR FROM THE DECLINATION AT GREENWICH NOON, AS GIVEN IN THE EPHEMERIS

either north or south, the daily change is least, being approximately one or two-tenths of a minute in 24 hours.

The diagram shown in Fig. 3 is based on the varying change in declination, for various altitudes of the sun, and shows at a glance the actual change that must be added to or subtracted from the declination at Greenwich noon, as taken from the Ephemeris. The amount of such change will depend on the difference in time as determined by the longitude of the place of observation east or west of Greenwich, and varies also with the declination. It is important to observe that, for all places north or south of the equator, the declination *increases* from the equinox to the solstice, and *decreases* from the solstice to the equinox. It is necessary, of course, to add the estimated change in declination to that given in the Ephemeris when the declination is increasing to obtain the correct declination at any given time for places west of Greenwich and subtract such change for places east of Greenwich. On the contrary, for a decreasing declination, it is necessary to subtract the estimated change from the declination given in the Ephemeris, for all places west of Greenwich, and to add the change for all places east of Greenwich.

The diagram (Fig. 3) makes it possible to ascertain the amount of change in declination for any longitude east or west of Greenwich, and any mean sun time at which an observation is taken, having due regard to the declination of the sun at that time.

TO FIND THE DECLINATION WITH THE DIAGRAM, FIG. 3

Follow the diagonal hour-line corresponding to the time of taking the observation to its intersection with the vertical line corresponding to the longitude of the place; and project this point of intersection horizontally on to the diagonal corresponding to the declination at Greenwich noon, as taken from the Ephemeris. Then, follow this declination-line to the scale at the top or bottom of the diagram, as the case may be.

The reading of the scale at the point indicated by the said declination-line will give the estimated change of declination, in minutes, which must be added to the declination at Greenwich noon when the declination is increasing, or subtracted from the same when the declination is decreasing, for all longitudes west of Greenwich. For longitudes east of Greenwich, the estimated change in declination must be added to the Greenwich noon declination when the declination is decreasing or subtracted from the same when it is increasing.

It will be observed that when the diagonal hour-line would have to be extended below or above the horizontal lines of the diagram, in order to intersect longitudes less than 45 deg. east or west of Greenwich, such hour-line is extended, as a dotted line, upward or downward, as the case may be, so as to cross these longitudes. The procedure, in that case, is the same as before, the intersection of the dotted hour-diagonal with the given vertical longitude-line being then projected horizontally onto the given declination-diagonal, whose intersection with the scale, at the top or the bottom of the diagram, will indicate the change in declination for the given time and place.

This diagram is somewhat different from the diagram proposed by the inventor of the instrument. It is one I have devised as being a more logical and simple pres-

entation and one that will be more readily used in practice. Fig. 4 shows the leather shoulder bag for carrying the meridiograph, together with ample pockets for field notebooks. As a simple, complete and practical device for finding the true meridian, I can strongly



FIG. 4. BAG FOR CARRYING THE INSTRUMENT

recommend this instrument for field use. It is a remarkable time saver, which will be well appreciated by those whose daily work compels the use of the solar attachment for ascertaining the meridian of a place. The possible error in the use of this device will not exceed one or two minutes at the utmost. Full instructions for its use accompany each instrument. As is well known, the best time for taking observations on the sun, for the purpose of determining a true meridian, is in the early forenoon or later in the afternoon when the error of the determination will not exceed one minute. When the observation is taken closer to noon, the error may reach two minutes. Owing to the increased refraction of the sun's rays, it is inadvisable to take an observation before 9 a. m. or after 4 p. m., if this can be avoided.

Coal Carbonization in Gas Retorts

The present heavy demand for benzol, toluol and other byproducts of coal distillation has modified the gas engineer's methods. A high yield of gas is a prime necessity to meet the demands for gas for its various services. But certain elements enriching gas are reduced to increase the supply of benzol which is of such prime importance in the manufacture of explosives.

At the Macclesfield gas works in England the gas yield per ton of coal is said to have been increased and at the same time to have obtained largely increased yields of tar and ammoniacal liquor, the latter furnishing fertilizers so urgently needed. This result has been attained by injecting steam into the base of the retorts, thus generating blue water gas. This method removes the last trace of gas from the coal and washes out the tarry matter before the tar has been subjected to destructive distillation. No deterioration has been noticed in the retorts as the result of steaming, and surging has been reduced to a minimum.

Strip Mining Where Bad Roof Prevails

BY RALPH W. MAYER
Connellsville, Penn.

SYNOPSIS—A considerable area of the Pittsburgh bed of coal near Burgettstown, Penn., has comparatively shallow cover and an extremely bad roof. This is being profitably recovered by means of stripping. Because of the nature of the overlying rock blasting must be extensively practiced and carefully executed.

A LARGE area of coal at Burgettstown, Penn., about 25 miles west of Pittsburgh, has a poor roof, one that it is almost impossible to hold up without lagging between timbers placed close together. The cover is shallow. The coal worked is the Pittsburgh bed, is of good quality and varies from 5 to 7 ft. in thickness. The same district contains a considerable amount of coal which has a good roof and is easily secured by the usual methods of underground mining.

The Harmon Creek Coal Co. is successfully mining out large areas of this coal which has a poor roof by means of stripping. Six-inch holes are drilled from the surface down to the top of the coal. These are placed 25 or 30 ft. apart. Keystone steam drills and gasoline drilling machines are used. These are self-propelled, moving from place to place under their own power. The covering on the coal is from 20 to 40 ft. thick and consists of soil, shale, slate, and in some places a harder rock closely resembling limestone.

After the machines have finished drilling the holes, they are sprung three times to form a chamber above the coal to hold the final charge of powder. The first springing charge consists of six or eight sticks of dynamite. This shoots the mud out of the hole and slightly enlarges the bottom. The second charge consists of about half a box of dynamite, and for the third springing charge about a 50-lb. box is used. It is unnecessary to clean the borehole after each charge. The shots throw the dirt up through the borehole onto the surface.

After the holes have been sprung three times they are given the final charge, which consists of black powder. Twenty to thirty 25-lb. kegs of FFF black powder are used for each hole. The tops of the kegs are cut partly off and the powder poured from the keg directly down the borehole.

The powder is exploded by using No. 6 electric detonators with 30-ft. wires. Two detonators are placed in each hole, so that in the event of the failure of one a second could be fired. Each detonator is placed in the end of a stick of dynamite and two half hitches of the lead wires of the detonator are taken around each end of the stick. Thus the stick of dynamite with the detonator in it hangs vertically in the borehole when it is lowered into it by means of the 30-ft. lead wires. This prevents the dynamite from catching on the sides of the hole and refusing to go farther. One or two kegs of powder are then poured on top of the dynamite sticks which contain the detonators. After the explo-

sives have been placed in the hole it is filled with tamping, the soil surrounding the hole being used for this purpose.

A stick about 25 ft. long and 2 or 3 in. in diameter is used as a tamping tool. A $\frac{1}{2}$ -in. rope is fastened to the end of this stick, so that it hangs perpendicularly in the hole when supported by the rope.

One man continuously uses the tamping stick while the powder and tamping is being put into the hole, pounding both firmly into place. He also holds the lead wires of the detonator to prevent them from dropping into the hole. He does this by taking a couple of turns of each lead wire around each of his feet, thus holding the wires against the side of the hole. He has free use of both his hands for tamping the hole. Two men usually pour out the powder, while a fourth man occasionally helps and in general oversees the work of loading and tamping. It is necessary to exercise care in filling the holes with tamping and not introduce the soil into the hole so fast that it chokes and gets clogged.

HOLES FIRED AT ONE TIME BY ELECTRICITY

When 10 or 15 holes have been loaded and tamped they are all fired simultaneously by means of an electric current. The resultant explosion has the effect of lifting the rock for a considerable space or area up off the coal and dropping it back again, thus shattering it but causing little disturbance upon the surface. The charge of explosives for a hole is of course varied according to the depth and nature of the overburden.

Where the rock is unusually hard, or the hole a trifle moist, four or five boxes of dynamite in the bottom of the hole, then 15 to 20 kegs of powder and three or four boxes of dynamite on top of the powder may be used. The holes are almost all dry after being sprung. Occasionally a wet hole will occur. In such a case a hanging charge of dynamite is exploded at the top of the water in the hole. This cracks the rock so that the water drains off, leaving a dry hole. The dynamite used is of 40 per cent. strength.

As a protection in inclement weather for the persons loading the holes and to keep the explosives dry, a V-shaped shelter is used. Each side of this shelter is about 6 ft. wide, and 6 ft. high. It is set on its end over the hole to be loaded, the point of the V facing the wind. The top of the V is covered with a flat roof affording protection from above. This shelter is made strong and light in weight so that it can easily be moved from hole to hole.

The drilling machine has a small blower or fan which is placed just in front of the flywheel of the engine. The fan has a pulley of small diameter fastened to its shaft and is mounted on a small swinging platform which may be swung so that the pulley of the fan comes into contact with the circumference of the revolving flywheel of the engine, thus rotating the fan. A 2-in. hose leads from the fan to a forge, which is used for heating the bit of the drill when it is necessary to sharpen it. The hose terminates in 3 ft. of iron pipe which finally leads the blast to the forge. This pipe is buried

a few inches underneath the ground and over its end a simple forge made. The air from the fan coming through this hose and pipe makes a good fire.

A few loose bricks set up on edge, two high and others laid loosely across their top and across one end, and covered with dirt, leaves an opening large enough for the bit of the drill. This makes an effective forge, and one that is quickly built and easily moved from place to place. It has only the opening at the bottom where the air enters through the 2-in. pipe and the opening at the end which receives the bit. Into this the coal is fed, and from it the smoke issues. A few small lumps of coal will quickly heat the bit of the drill.

This forge is made two brick lengths long. These two bricks are placed on edge and two more are placed on edge on top of them. Four bricks thus form one side. The two sides are so placed that bricks can be laid lengthwise from one side to the other. The top and end are built up in this manner. They are covered with dirt to give the entire structure firmness.

When the overburden has been broken by the use of explosives it is shoveled back off of the coal and deposited upon the ground from which the coal has been removed. A strip of ground across the coal field is drilled and loosened by explosives. This strip is then cleaned of its overburden and the coal underneath removed. The strip from which the coal has been removed makes room for depositing the overburden of the next adjoining strip.

WASTE SHOVELED BACK BY STEAM SHOVELS

Four Marion steam shovels, Model 300, are used for stripping or shoveling back the waste. The buckets range in capacity from 6 to 8 cu.yd., and the booms are from 85 to 95 ft. in length. Each shovel runs on short lengths of rail which are removed from its rear and placed in front as the machine advances. The track for the railroad cars is placed immediately upon the coal and on the side of the stripping next the virgin ground, or on the opposite side of the strip from the waste pile or dump.

These works are on the main line of the Pennsylvania R.R. Panhandle route. The railroad cars are left on a siding. The Harmon Creek Coal Co.'s locomotives take them from this siding and haul them directly into the pit or onto this track laid upon the top of the coal. Here they are loaded by means of a Marion steam shovel, Model 36. This model is provided with a caterpillar truck, and can travel over the inequalities of the floor with ease. It works in the lowest part of the cut into which the water drains if any is present and where it might be troublesome to lay track. This type of truck gives it great freedom of movement.

The shovel moves by its own power, but in a hard place where this is insufficient the power of the dipper engine is also utilized. This is done by means of a piece of cable or sling having an eye spliced in each end. This cable is passed underneath the top half of the caterpillar belt a few feet back from its front end. The eyes on the two ends of the cable are then hooked over the teeth of the shovel. When the dipper is raised or pushed ahead the cable tightens and pulls on the belt, thus helping to move the machine ahead. The coal in the seam is not shot, the shovel being powerful enough to loosen it.

This shovel runs upon the floor of the coal bed and loads the coal directly into the railroad cars. The shovels work in pairs, each stripper being accompanied by a digger. Each stripping shovel works two 10-hour shifts per day, while each loader works one shift.

Several men work ahead of the loading shovel, sweeping off the top of the coal with wire brooms and throwing back the sweepings. Three men also work in the car while it is being loaded, throwing out slate and refuse. Picks are here used to break the pieces of slate loose from the coal when necessary. They also signal the shovelman not to dump a shovelful of coal when they have not all the slate thrown out of the car. The crane-man dumps the coal into the car in such a manner that it is spread out so that the slate may be easily seen. The slate is thrown off the car on the side opposite the shovel or between the railroad track and the face of the next stripping. The stripping shovel throws this slate back along with the waste when it makes its next cut.

LOCOMOTIVE WORKS IN CONJUNCTION WITH SHOVEL

A locomotive constantly serves the loading shovel to shift the cars to the proper position for easy loading and to take away the loads and return with empties. Only a few minutes are required to take out the loads and return with empties from the sidetrack. While the locomotive is doing this the shovelman is loosening up the coal for loading succeeding cars. The company has its own locomotives and sidetracks.

The coal seam lies practically level and high so that the water drains off into the valleys, which cut the seam where it outcrops. Where there are swamps or depressions the water is pumped out with gasoline pumps. Box drains made of planking are laid on the floor and covered with the waste piles where the deposits of waste would dam back the water from flowing out of the pit or open cut.

The water-supply for the boilers of the steam shovels and locomotives is obtained from a reservoir made by damming a small creek. The face of the dam is rip-rapped with flat stones, and a concrete spillway takes care of the overflow. A pumping plant at the reservoir forces the water through pipe lines to the different works, connections being made to the steam shovels by hose. The locomotives fill their tanks from stand pipes placed at convenient points.

Part of the field carries another seam about 2 ft. thick, overlying the Pittsburgh bed but separated from it by several feet of rock. This bed (known as the Rooster seam) also contains a good quality of coal, but aside from being used in the steam-shovel boilers, where it can be conveniently secured, it is wasted as the cost of its recovery would be prohibitive.

Several men are employed to keep the waste shoveled up to the face in front of the stripping shovel on top of the coal. This top of the coal seam forms the floor upon which the stripping shovel operates. The stripping shovels easily handle any pieces of rock which they encounter without difficulty.

The company began stripping operations in February, 1917, and commenced loading coal in September, 1917. In this short time the shovels have uncovered a large area of coal a mile or more in length.

The Harmon Creek Coal Co. also has underground operations in this same vicinity. At present the output

from these workings amounts to about 300 tons per day, but eventually it is the intention to secure at least 1000 tons from below ground. Power for underground mining and haulage will be purchased from the West Penn Power Co. It will be received at 22,000 volts and stepped down and converted before application to the various motors. At present power is supplied by a Western Electric generator direct connected to a three-cylinder gas engine working on natural gas.

The Coal Problem*

BY E. G. BAILEY
Boston, Mass.

The biggest and most important question before the American people today is the coal problem. The abnormally high percentage of ash and impurities in the coal is like sand in the bearings of transportation and of industry, slowing them down at the most critical time in our history. The less ash and impurities in coal, the less the number of tons required. The greater the demand for coal, the higher the price and, under present conditions, the poorer its quality. The price has been regulated; but the quality has run riot.

Why have we allowed this to happen just at the time when we need heat in concentrated form? Why are the railroads burdened today with hauling millions of tons of utterly worthless dirt? To say that this excess of ash in the coal is worthless, does not describe the situation. The price paid for this dirt is only a small fraction of the damage. The rest lies in the decreased efficiency, the lowered capacity, the increased labor and the excessive repair bills involved in the combustion of this coal—and in the necessity of closing down industries because of the lack of the coal which might have been shipped in place of these so called "worthless," but really exceedingly costly impurities.

Results show a 10% decrease in the amount of coal delivered to many plants during the past year. Considering that the Navy and other Government requirements receive a greatly increased tonnage of the best coal, a conservative estimate of 5 per cent. is made as representing the increased demand for coal due solely to the poorer quality of that received. This means that 30,000,000 tons of utterly worthless slate and dirt were loaded into railroad cars and delivered to the consumer, where it caused additional trouble in burning the coal with which it was mixed.

On the basis of the average price of coal delivered to the consumer being \$4 per ton, this excessive amount of impurities has cost the country \$120,000,000 during the past year. Adding to this the various estimates made of the cost of our heatless holidays, ranging from \$1,000,000,000 upward, it is obvious that this question of impurities in coal is of such tremendous importance that an effective remedy must be found immediately. Manufacturers would be glad to pay a dollar per ton more for coal if they could get what they need and of standard quality.

Competition normally compels the mine operator to clean his coal, but when the coal shortage began, in 1916, manufacturers were so anxious to get fuel that they offered and gladly paid prices of \$5 to \$6 per

ton at the mines and took anything that was black. For this reason quality went from bad to worse. Under the present system of paying the operator prices fixed by the Government, no distinction whatever is made between the best and poorest grades of coal. They both command the same price, so why should one operator go to additional expense of shipping clean coal when he receives no more pay than his competitor who loads dirt?

To simply appeal to the miners and operators, even on the grounds of patriotism, is not sufficient. To increase the Government price on the present basis of control of \$5 per ton at the mines would not reduce the percentage of impurities in the coal one iota. We must apply a remedy that has some economic foundation.

The remedy suggested is to establish standards of quality and pay a premium for clean coal. The price paid to the operator should be based on standards established by the Fuel Administration according to different mining districts, etc., with premiums based almost entirely upon percentage of ash, and especially the free ash such as slate and rock which can and should be eliminated at the mines.

Coal-sampling stations should be established by the Government at certain central points where large quantities of coal are received direct from mines. Each station should be equipped with machinery for obtaining representative samples from as many individual cars as necessary to determine the average quality of coal shipped from each mine during each month.

The operator would not know what cars were to be sampled, for the Fuel Administration could consign or reconsign any cars in transit to the coal piers or power houses where the sampling stations were located. The mine operator would therefore have a real incentive to load every car with as clean coal as possible.

The car distribution at the mines, which is an important point to the operator, should also be based upon the quality of coal produced so that there would be an added incentive to load clean coal, and the market would always be supplied with a greater proportion of the better quality of coal than if the empty cars were prorated equally as at present.

Actual knowledge of the quality of coal would also be of great benefit to the Fuel Administration in classifying various mines into pools so that the consumer and particularly the railroads would receive coal of uniform quality, thereby enabling them to obtain maximum capacity and efficiency in the combustion of this coal.

There is sufficient labor at the mines to clean the coal, and the railroads can haul enough good coal, but they cannot get the necessary heat units to the consumer if they must be burdened with 30,000,000 tons of unnecessary dirt. We have our choice of either building thousands of locomotives and a hundred thousand cars and adding to the terminal facilities of our railroads within the next few months or removing the excessive impurities from the coal. The latter can be done quickly and effectively.

It is also urged that all power plant engineers put forth every effort to obtain maximum efficiency from the combustion of coal. A few simple points in regard to improving the work of the fireman by observing the appearance of the flame from the boiler furnace, and

*Abstract of a lecture delivered at the Johns Hopkins University, Baltimore, Md., Feb. 27, 1918, as one of the J. E. Aldred lectures on Engineering Practice.

maintaining boilers and baffles in good condition will secure worth-while results.

Are we going to have enough coal to see us through the coming winter? The present indications are that unless some radical steps are taken immediately, the coal shortage will be much worse than it has been. To be satisfied with preferential shipments and permit many of our basic industries to close down, is to be a quitter; when, by concentrating our efforts on loading clean coal at the mines, and improving the efficiency of its combustion in furnaces we can have ample coal for all.

We have heard the argument that we should be patriotic and be content with inferior coal—old culm banks and other refuse fuel—the same as we are with wheat substitutes in our bread. But the food and fuel problems are different.

Economy in the use of these commodities applies equally to both, but the neck of the bottle of the food question is production, while the weakest link of the coal problem is transportation. It is a crime to burden our railroads with hauling dirt when it is within our power to ship clean coal and supply heat in concentrated form.

It is as important to be on time for a business appointment or a business schedule as it is to meet a train or be prompt at a wedding. It's all a matter of habit and calculation. The man who never calculates to meet his appointments will be equally lax about his bills. Form the habit of arranging your affairs so as to be prompt or even a little better than prompt.

Blast away your selfishness, sink a shaft of light
Deep into the chambers of your heart;
Make your vein of loyalty plain to all men's sight
Mine it for your country—do your part!
Drill into your pocketbook, shoot the dollars free
(Even if the seam is not so big);
Trade them to the Nation for the Bonds of Liberty
Dig—the way a miner ought to dig!

Make a proper job of it, pick your pockets clean,
Don't leave any dust, a single pinch;
Bring up every particle that your eye has seen,
Uncle Sam can use it, that's a cinch.
Undercut extravagance with the chain of thrift,
Shovel up the savings, neat and trig,
Ship them into Washington, give the war a lift,
Dig—the way a miner ought to dig!



Shovel Up the Savings.

Increase in the Output of French Coal During the War

In spite of the difficulties caused by the submarine war, and the occupation by German troops of several important centers, the Chamber of Commerce of Paris states that the production of French coal is continually progressing, as will be seen by the following table giving, in tons, the whole monthly output of the different coal fields.

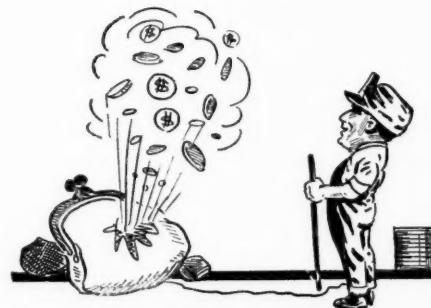
	1916	1917
January	1,691,399	2,011,377
February	1,689,566	1,903,179
March	1,879,527	2,367,090
April	1,710,394	2,181,172
May	1,904,478	2,296,950
June	1,751,180	2,345,251
July	1,771,769	2,410,039
Output for first 7 months	12,398,313	15,515,058

The monthly output, in France, rose in a year from 1,771,769 to 2,410,039 tons, making an increase of 36 per cent.

Each of the coal-fields has taken its part in the common effort. The Pas-de-Calais mines, some of which are in the hands of the enemy, have increased their output by 50,000 tons a month since May last. The Loire coal fields yielded, from 1916 to 1917, about 400,000 tons more than the previous year. In the Gard coal fields the increase from one year to another exceeds 33 per cent. The secondary fields of the Tarn, Saône-et-Loire, are also helping with the increase in the general output, which enables us to conclude, judging by the figures for the last four months, that the total yield for 1917 will be over 28 million tons, whereas in 1916 it hardly realized 20 million tons.

Dig!

Written Expressly for "Coal Age"
BY BERTON BRALEY



Shoot the Dollars Free

Tilt your spendthrift tendencies over on the dump,
In the test of war they're only slate;
Strip your purse and bank account—collar down to sump—
Do it now! Don't lallygag and wait.
Miner, trapper, engineer, checker, clerk and boss,
Hoist up all you've gathered, small or big.
Buy the Bonds of Liberty, smile and come across,
Dig—the way a miner ought to dig!

The Byproduct Coke Oven, Its Coke and Its Byproducts—II

BY WILLIAM HUTTON BLAUVELT

Consulting Engineer, Syracuse, N. Y.*

SYNOPSIS—*The use of coke for domestic purposes has become widespread. Coke is now made from coals that formerly were considered unsuitable when the beehive oven was still the recognized medium for coking. Observations are made by the author on the recovery of ammonia and benzol and the use of coke-oven gas. Tar is used as a fuel in metallurgical furnaces.*

In addition to the iron blast furnace, foundry cupolas afford a steady market for coke, and in recent years the domestic market has grown to importance. Before the war, sales of coke for domestic use amounted to over 1½ million tons per annum, although these sales really rather demonstrated the value of coke as a domestic fuel than showed what were the ultimate possibilities of the trade. Foundry coke is usually made on a somewhat slower coking time than furnace coke, as cupola practice calls for larger and tougher pieces.

The production of domestic coke is now a greatly different industry from what it was in earlier days, when most of the domestic coke was produced in gas works. At that time it was often regarded as something to be got rid of with the least trouble, rather than as a regular and important source of income to the works. Great care is now taken in the sizing and preparation of domestic coke and the complete removal of breeze and dirt. The following table shows approximately the usual sizes produced:

	Size of Square Through, In.	Opening on Screen Over, In.
Egg coke.....	3.5	1.5
Nut coke.....	1.5	1.0
P. a. coke.....	1.0	0.5
Breeze.....	0.5	....

These screens are varied locally to meet market requirements. It would be desirable to have a standard for each domestic size throughout the country, but where the demand for one size is large relative to another, it is natural for the operator to modify his screen openings accordingly.

In American practice, where domestic coke competes mainly with anthracite, a hard structure is generally regarded as desirable. This is contrary to English practice, where familiarity with bituminous coal as a domestic fuel makes quick inflammability a desirable quality, so that coke containing a considerable amount of volatile matter is often sold successfully. Even the partially coked coal, known as "Coalite," which is produced by a low-temperature distillation, is preferred to the hard clean coke which is becoming familiar to the American consumer.

*By an error the author of this paper was said in the previous instalment, which appeared Apr. 6, to be the coke expert of the United States Fuel Administration, thus confusing him with Warren S. Blauvelt. This paper was presented at the New York meeting of the American Institute of Mining Engineers, Feb., 1918.

The practice of locating American ovens at the point of consumption of the coke has made it easy to bring together several coals of different qualities, and this has in many cases permitted the production of a better coke by admixture than could be made from either of the coals used alone. For example, a coal of excellent coking qualities but high in ash can be mixed with a low-ash coal of poorer cokability, or an excess or deficiency in the coking quality of the main coal supply can be corrected by mixture with another coal.

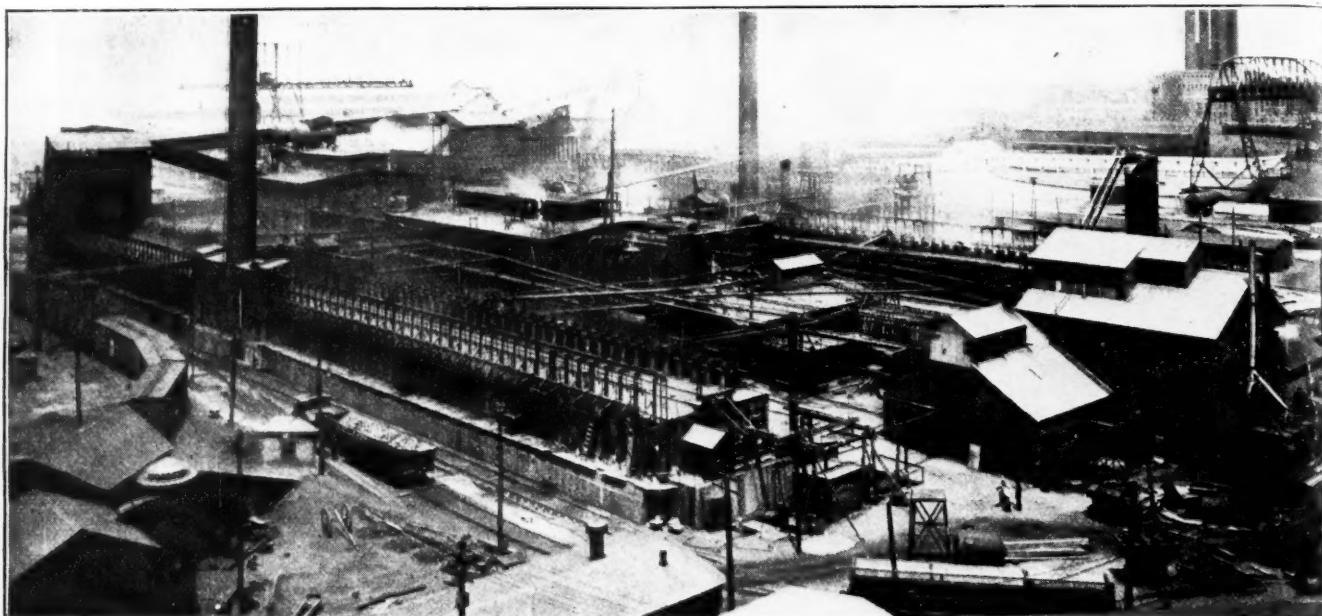
Except in cases where the source of coal supply is fixed, it seems desirable to arrange the plant for the preparation and mixing of as many as three kinds of coal. Means permitting the accurate proportioning of the different coals are, of course, essential in such a plant. The mixture of coals generally calls for their being ground quite finely, in order to bring the particles of the different qualities of coal closer together. The general practice is to grind so that from 70 to 80 per cent. or more will pass through a ¼-in. screen. This fine grinding is also often advantageous where there are many pieces of slate of considerable size in the coal, since a large piece of slate in the coke is usually a center of cracks that tend to shatter the structure.

USE OF COALS FORMERLY CONSIDERED UNSUITABLE

Various degrees of fineness in grinding are often adopted to improve the structure of the coke, but in some cases, especially where only one coal is used, a better structure is produced from considerably coarser coal. Fine grinding reduces the weight of the coal mass per cubic foot, and consequently the capacity of the oven. With ordinary coals the weight per cubic foot of charge is generally taken at from 40 to 43 cu ft. per ton, depending somewhat on the coals, and largely on the degree of fineness.

The byproduct oven, with its control of heats, coking time, mixture of coals and fineness in grinding, has permitted the use of many coals for making metallurgical coke which would not have been suitable with the beehive oven. As the best coals are being progressively exhausted, this point becomes more important. Owing to the extraordinary conditions caused by the war, some coals hitherto considered entirely unsuitable for making metallurgical coke have been successfully used; for example, the unwashed coals of southern Illinois.

To use these hitherto unsuitable coals successfully it is necessary to make a careful study of the coking qualities of each one in order that any deficiencies it possesses may be supplied by the proper selection of the coals forming the mixture. Very satisfactory furnace results have been gotten when using important percentages of coals heretofore considered unsuitable, and these results are encouraging on account of the progressive disappearance of the best of the coking coals now available. The distillation of coking of coal in closed retorts,



LARGE SEMET-SOLVAY OVEN PLANT AT DETROIT, MICH.

now generally known as byproduct ovens, was first introduced for the purpose of saving the several valuable products contained in the volatile matter of the coal, which were all destroyed in the beehive process. The advantages in the production of coke outlined above were not then realized. In fact it was often thought that a sacrifice of coke quality must be accepted in order that the byproducts might be recovered. Fortunately it has developed that the best oven conditions for the production of coke are, in general, the best for the production of byproducts also.

The composition of the volatile matter in bituminous coal is very complex and the changes through which these compounds pass during the process of distillation are also complicated. It is not appropriate here to attempt to trace out these changes or to discuss the method of formation of the ammonia, benzol or other byproducts. It is well known that only about one-fifth of the nitrogen in the coal combines with hydrogen to form ammonia, and that the remainder is found in the coke and gas.

Attempts have been made to obtain higher yields of ammonia by blowing steam into the coke, somewhat after the manner followed with the Mond producer, which recovers from three to four times as much ammonia, but none of these processes have been developed commercially. Higher coking heats tend to break down the combinations to their ultimate elements.

For example, the gas produced from high-temperature coking will contain more hydrogen and less marsh gas, and a larger volume will be produced of lower calorific value. When coking at very low temperatures, as in the production of "Coalite," practically no benzols are produced and the hydrocarbons recovered are of the aliphatic series. At high coking temperatures the tendency is for the toluol, the more complex hydrocarbon, to break down into benzol, and at very high temperatures the yields of both are reduced. The temperature conditions to which any particular particle of hydrocarbon is submitted in its travel from the original piece of coal up to the hydraulic main are so complicated and so varied that a theoretical discussion of these reac-

tions would be of little value to the coke manufacturer. The gases passing off from the oven are heavily laden with various hydrocarbon vapors and with water vapor and consequently carry a large amount of latent heat. So the cooling of the gas and the condensation of the vapors require efficient condensing apparatus and large amounts of water. The gas-works manager of early days used to deal gently with his gases in removing the tarry vapors and cooled them very slowly in order to prevent their taking up the benzols from the gas, with injury to its illuminating power, but in coke-oven practice this precaution is not considered necessary.

Much improvement has been effected in the efficiency of the condensing apparatus since the early days of the tubular cooler, in which the gas circulated around the tubes of an apparatus similar to a vertical boiler, while the cooling water flowed through the tubes on the countercurrent principle. I have in mind one single-stage condensing apparatus 10 ft. in diameter and 45 ft. in height of effective cooling surface in which 12,000,000 cu.ft. of gas per day is cooled on the average from 80 degrees to 20 degree C.; in which the cooling liquor enters the apparatus at a temperature 5 degrees below the exit temperature of the gas, and leaves it at not more than 10 degrees below the entering gas temperature. In such an apparatus very little condensate separates from the gas at a low temperature, and as a result the benzols remain in the gas and the separation of tarry matter from the ammonia liquor is sharp and easily effected.

A small quantity of the lightest tar vapors remain in the gas with the benzols. These may be removed by some efficient form of the old Pelouse and Anzin tar extractor, or where the gas is washed with water to remove the ammonia in the indirect process of ammonia recovery, these light tars are efficiently washed out. An efficient system of removing these light tars in a high-tension electric field has been developed by F. W. Steere, the plan adopted being similar to that used in the well-known Cottrell system, except that the special conditions permit the use of an alternating current of the necessary high voltage, since the problem is merely the agglomeration of the minute globules of tar to permit

their effective removal by tar extractors of the usual type. This process has been worked out commercially and is simple and effective.

One of the interesting developments in the operation of byproduct ovens in connection with steel plants is the growing use of tar as a fuel for metallurgical furnaces. I have in mind one plant producing over 20,000,000 gal. of tar per year, in which the entire amount has for years been utilized as fuel in open-hearth and heating furnaces, where its value as fuel is much higher than its value in the ordinary tar market. Generally speaking, the tar used in steel furnaces is handled in the same manner as ordinary petroleum fuel oil, having about the same viscosity, and its use presents no difficulties after the details of its application have been worked out. It has a higher fuel value per gallon than ordinary petroleum fuel oil.

It was formerly the universal practice to extract the ammonia from coke-oven gas by scrubbing with water, which has a large capacity for absorbing ammonia at moderate temperatures. This was the old gas-works method, and the processes as used in oven plants are the same except as modified to meet the conditions of large volumes and efficient recovery. The ammonia is recovered by these absorbing processes in the form of a crude liquor, usually containing from 0.5 to 1 per cent. of ammonia.

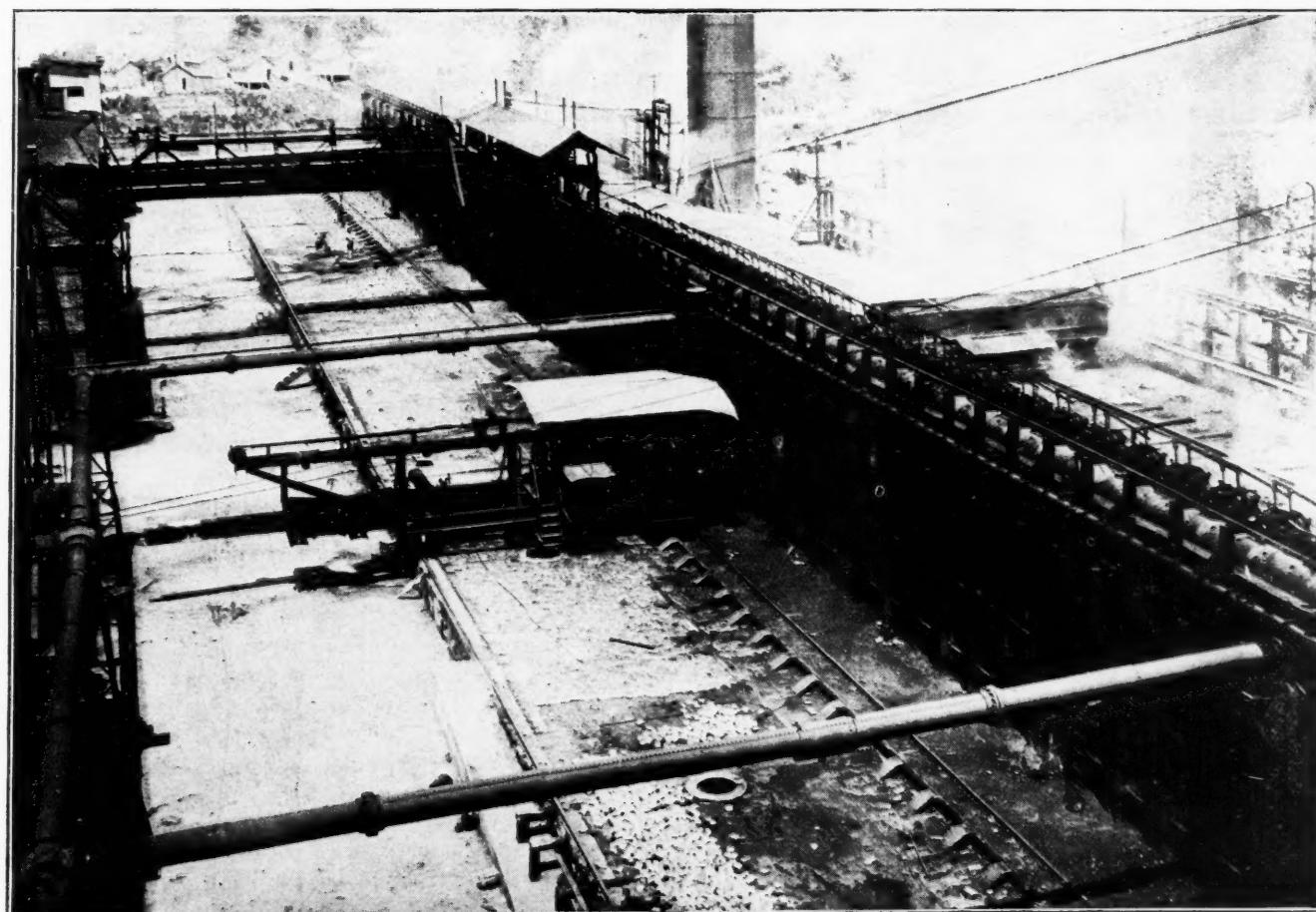
This liquor usually contains practically all of its ammonia in the free state, whereas the condensate from the coolers carries considerable amounts of fixed ammonia, sulphate, carbonate, chloride and sulphide. After removal of the tar by decantation the combined liquors

are distilled with steam, after setting free the fixed ammonia by means of lime, the product being the crude ammonia liquor of commerce. In other plants the vapors from the still are passed through a sulphuric-acid bath and sulphate of ammonia is formed.

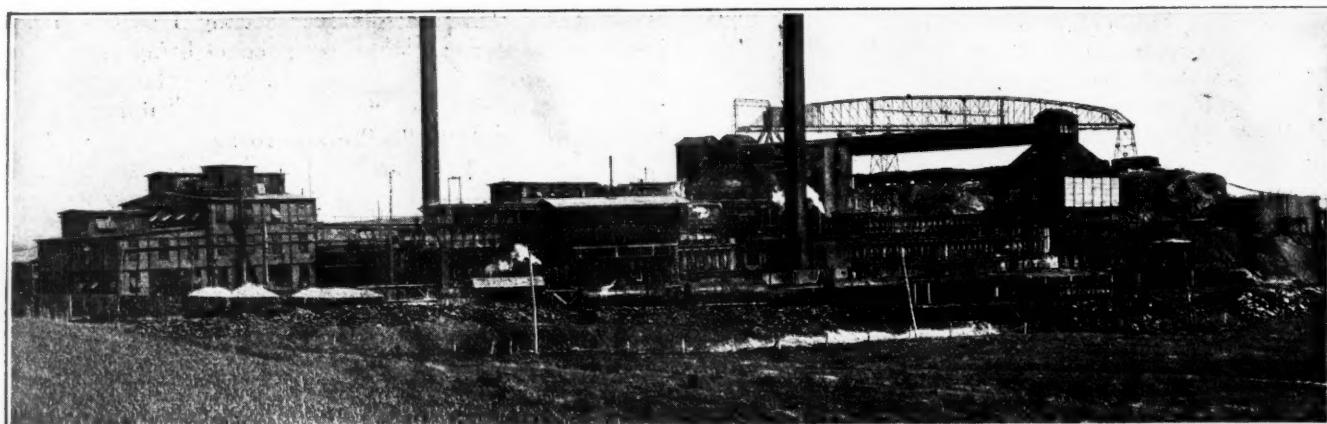
The so-called direct and semi-direct processes for the manufacture of ammonium sulphate have been very generally applied to oven plants in recent years. The direct process requires only the removal of the tar from the gas without any more cooling than is necessary for this purpose, after which the gas is passed through a bath of sulphuric acid and the sulphate recovered. The direct process has been applied to a considerable extent in Europe, wherever the percentage of chlorides in the coal is small, but where the amount of chlorides is relatively large it is necessary to remove them before the acid bath is reached.

This introduces the "semi-direct" process, in which the gas is cooled to remove the chlorides and then reheated and passed into the acid. The fixed ammonia condensed out in the cooling process is distilled and generally the ammonia from the stills is returned to the gas before it reaches the acid bath. The percentage of ammonia that has to be distilled in the "semi-direct" process depends upon the amount of fixed ammonia in the gas and varies from 15 to 40 per cent. of the total ammonia.

Sulphate of ammonia was formerly the only source from which pure ammonia in the form of *aqua ammonia* or anhydrous ammonia was produced. This process consists in the distillation of the sulphate of ammonia using lime to free the ammonia from the sulphuric acid,



BLOCK OF BYPRODUCT OVENS WITH THE PUSHER BY WHICH THEY ARE DISCHARGED



BETHLEHEM STEEL CO.'S SEMET-SOLVAY BYPRODUCT OVEN PLANT AT LEBANON, PENN., COMPRISING 90 UNITS

the small amount of hydrocarbons remaining in the sulphate being removed by charcoal filters or other similar means.

If anhydrous gas is to be produced the gases in the top of the still are dried by means of quicklime or other desiccating material, and the pure gas is then compressed and pumped into the steel cylinders so familiar to the trade. *Aqua ammonia* is produced by absorption of the pure gas in distilled water. This process is essentially a simple one, but the purification of the ammonia gas and the necessity for providing against the blocking of the apparatus by accumulations of calcium sulphate scale somewhat complicate the work.

In recent years by refinements in the distillation process it has been made possible to produce pure ammonia direct from the crude weak liquor and this product is quite equal in quality to that produced from ammonium sulphate as above described. These processes have the advantage of avoiding the waste of sulphuric acid inherent in the ammonium-sulphate process.

EFFECT OF THE WAR ON THE AMMONIA MARKET

The war has introduced many unprecedented conditions to the ammonia producer. Before the war the price of sulphate of ammonia varied, in general, between 2½ and 3c. per pound. Official quotations are now running from 7.25 to 7.35c. While these high figures do not represent the average of actual transactions, any more than the \$55 per ton frequently quoted represented prices at which the pig iron of the country was moving last summer, yet they illustrate the unsettled conditions of the market. Recently the Government has asked for very large amounts of ammonia for war purposes, and this call for ammonia has introduced much discussion as to the best methods for producing it.

In times of peace the great bulk of the ammonia goes into sulphate for fertilizer purposes, and most oven plants have been built for supplying this product. The Government's needs have caused many inquiries regarding the changing of these plants to produce other forms of ammonia, but this is usually practically out of the question on account of the great time and expense involved. Large parts of the recovery plants would have to be entirely rebuilt in order to change the product. Fortunately there are several practical methods for the conversion of ammonium sulphate into ammonium nitrate, and the synthetic ammonia plants will soon have a large production directly available for this purpose.

The total ammonia from all oven plants now built or building is estimated at somewhat over 130,000 tons of NH₃ per annum.

In the earliest European byproduct ovens the gas distilled from the coal in the coking process was not sufficient in amount to heat the ovens properly and had to be supplemented with solid fuel. As the efficiency of the heating increased, the surplus, which was rather unreliable, was utilized for raising steam. As the supply became still larger it began to be introduced as one of the regular sources of fuel in metallurgical and manufacturing plants.

OVEN GAS USED FOR DOMESTIC PURPOSES

In America oven gas has long been used for domestic purposes, and now over forty important cities and towns are wholly or partly supplied with oven gas, and a number of years ago the daily sales for domestic purposes had reached 50,000,000 cu.ft. Europe has lagged far behind America in this application of oven gas.

Since the first introduction of byproduct ovens into America many experiments have been made in the use of oven gas for metallurgical furnaces, and several experiments have been recorded describing unsuccessful efforts to apply it to open-hearth steel furnaces, although it has long been used in heating other furnaces, soaking-pits, etc. During the last few years, however, the whole subject of using oven gas in open-hearth furnaces has been successfully worked out, and it is now in regular operation in several important steel plants. Since the benzol is now generally extracted from oven gas, it is usual practice to burn a certain amount of tar with the gas to give it luminosity and higher radiating power.

From 12 to 16 gal. of tar, together with from 8000 to 8200 cu.ft. of gas, the quantity depending upon its calorific value, are required per ton of ingots produced, and it is found that furnaces fired in this way can be depended upon to produce from 10 to 15 per cent. more steel than when heated with producer gas. These figures are based on work at stationary furnaces. On the basis of these figures it may be stated that the surplus gas and the tar obtained in the production of a ton of coke will furnish the necessary fuel to produce a ton of ingots from an open-hearth furnace. This statement shows how important as a source of fuel the byproduct oven is to a blast furnace or steel plant. Furthermore the value of the byproducts, other than the gas, should never be overlooked as a source of revenue.

Early in the development of the byproduct oven in America the principle of the separation of the richer portion of the gas, which comes off during the early part of the coking period, from the leaner portion was developed in a practical way. The chart showing analyses of gas [appearing in a previous installment of this article] were made when the oven was coking at the rate of about 1.15 in. of width per hour. That chart shows plainly the progressive decrease in the percentages of methane and the progressive increase in hydrogen and carbon monoxide, as the coking proceeds.

The separation of the rich from the lean portion of the gas is probably not advantageous when the surplus is to be used for fuel purposes, as, of course, separation introduces some complications into the apparatus, but where a higher calorific value than the average is desired, the separation method is of great value.

Before the general use of the byproduct oven, benzol and its homologues, toluol and xylol, or solvent naphtha, were produced from the distillation of tar, which usually contains about 3 per cent. of these compounds. Now, the main source of supply is coke-oven gas, from which the benzols are scrubbed by bringing the gas into contact with a heavy oil of petroleum or tar. This process is usually carried on after the removal of the ammonia. The benzolized heavy oil is distilled to drive off the benzols and the heavy oil is cooled and returned to the heavy-oil scrubbers. The benzols are recovered in the form of a "light oil," containing usually about 60 per cent. of benzol, 12 per cent. of toluol, and 6 per cent. of solvent naphtha, although these percentages vary considerably with the details of the coking process and the light-oil recovery.

Before the war the light oil produced was used largely for enriching illuminating gas, and the refined products were employed in the manufacture of paints, varnishes and in other similar industries. At that time many plants were not equipped to recover light oil. Since the beginning of the war the enormous demand for the high explosives, picric acid and trinitrotoluol, familiarly known as T. N. T., has resulted in the equipment of practically all the plants in the country for the recovery of these products. It is estimated that the plants now built or building have a capacity of 101,500,000 gal. of light oil per year. For the production of these explosives the benzol and toluol have to be thor-

oughly refined by washing in sulphuric acid and by accurate fractionation, which processes require skillful supervision. The removal of the light oils from the gas practically destroys its luminosity, but the reduction in calorific value is relatively small, about 10 B.t.u. per cubic foot per gallon of light oil recovered per ton of coal.

When the demand for high explosives ceases after the war a large amount of the benzol now produced will probably be sold as motor benzol. This product is usually a mixture of benzol, toluol and solvent naphtha in the proportions in which it occurs in the light oil, and it is obtained by a comparatively simple process of refinement from the light oil. Motor benzol has a fuel value from 18 to 20 per cent. higher than gasoline, and may be used alone with the ordinary carburetor if a somewhat larger proportion of air is used, or it may be mixed with gasoline in any proportion. Pure benzol freezes at 5.18 degrees C., and toluol at—180 degrees C. No trouble is experienced from freezing, even in the coldest weather, when proper percentages of toluol or gasoline are mixed with the benzol.

The dye and color industry in the United States has greatly expanded during the war, and it will flourish after peace has returned if given proper Government protection. This will furnish a large market for benzol which is the raw material for aniline. Also it seems not improbable that trinitrotoluol will be widely utilized as an industrial explosive. It is claimed that it can be manufactured more cheaply than nitroglycerine, and as a commercial explosive it has many advantages over nitroglycerine compounds.

Trinitrotoluol is very stable and ignites only at high temperatures, and even then it does not explode. It does not freeze, as does nitroglycerine, and on many counts it has advantages on the side of safety and convenience. When used alone it produces large amounts of carbon monoxide; but this can be entirely prevented by combination with other bodies, such as ammonium nitrate for example, if these are added in proper proportion to produce complete combustion.

From the above brief discussion of the development of what has grown to be one of the important American industries, it will be seen that the byproduct oven has given this country something which is much more than merely a cheaper method of producing coke.



PLANT AT CLEVELAND, OHIO, WITH BLAST FURNACE ON LEFT AND SEMET-SOLVAY BYPRODUCT PLANT ON RIGHT

Should New Coal Mines Be Opened?*

BY GEORGE S. RICE

Chief Mining Engineer, United States Bureau of Mines,
Washington, D. C.

SYNOPSIS — There has been no increase for several years in the number of men employed at coal mines, but a large increase in daily and yearly productivity, but this gain approaches a limit. The coal tonnage required per year is increasing, and the mines are continually being worked out. If no new mines were opened for two or three years the industry would cease to have the capacity for production necessary to supply the nation.

DURING the coal famine of last winter an interesting and important question arose as to whether the opening and development of new mines should be discouraged, the purpose of those favoring the restriction being to save the large amount of labor involved in the construction and development of new mines. This action was urged because of the scarcity of labor and more especially because the existing mines appeared to have a greater capacity than the consumption of coal made necessary. The question was referred to me for my comments and led to a study of the statistics relating to the development and production of coal.

The essential results of this study are indicated on the accompanying chart, which illustrates, among other things, the increase in production and consumption, and the estimated maximum production capacity of bituminous coal based on data published in the "Mineral Resources" of the United States Geological Survey. It covers the period from 1900 to 1916 inclusive.

The following curves have been drawn from the data secured: 1. Average number of days that the mines worked. 2. Yearly total production of bituminous and sub-bituminous mines. 2a. Yearly production of machine-mined coal. 3. Average annual production, equivalent to consumption, for a period of 17 years. 4. Number of coal-mine employees for each year. 5. Estimated capacity of mines, on basis of 300 working days in the year. 6. Estimated drop in capacity if no new mines are opened.

Considering these curves and the data from which they were constructed, it will be noted that the average number of days the miners worked varied from 193 in 1908 to 234 in 1900, the average being 217. The reasons why there is such a large proportion of idle days to the total number of working days in the year are well known, namely: (a) Lack of business; (b) lack of cars. Taking the country as a whole, lack of business is the important factor and this might otherwise be viewed as being an excess of productive capacity.

The yearly production of the mines, which practically equals the consumption, has shown on the whole a steady increase. An average line has been struck which indicates that the average annual increase of production has been 18 million short tons.

*A written discussion on the article entitled "Review of the Coal Situation of the World" read by the same author, George S. Rice, at the New York Meeting of the American Institute of Mining Engineers, February, 1918, and recorded in Bulletin No. 133, Jan. 1918, pp. 131 to 141.

The number of employees steadily increased until 1910; then for the succeeding 6 years it stood practically still. Fortunately, however, there has been a steady increase in the individual daily output of the bituminous and sub-bituminous mine employees, from a low point of 2.94 tons per day in 1901 to 3.91 tons in 1915. There was an insignificant falling-off to 3.89 tons in 1916. This increase in the individual capacity is unquestionably due to the larger use of undercutting machines and labor-saving devices.

Curve 2a, which shows the production of machine-mined coal, indicates that there has been a steady increase in the proportion of coal so mined. It remains

STATISTICS OF COAL PRODUCTION IN THE UNITED STATES

(Tons of 2,000 Lb.)

Year	Days World	Men Employed	Tons per Man- Day	Total Pro- duction, Million Tons	Machine- mined Coal, Million Tons	Esti- mated Ca- pacity,* Million Tons
1900	234	304,375	2.98	212	53	271
1901	225	340,235	2.94	226	58	301
1902	230	370,056	3.06	260	70	339
1903	225	415,777	3.02	283	78	378
1904	202	437,832	3.15	278	79	413
1905	211	460,629	3.24	315	103	449
1906	213	478,425	3.36	342	119	482
1907	234	513,258	3.29	394	139	505
1908	193	516,264	3.34	333	123	518
1909	(a)	(a)	(a)	380	142	(a)
1910	217	555,533	3.46	417	174	593
1911	211	549,775	3.50	405	178	595
1912	223	548,632	3.68	450	211	606
1913	232	571,882	3.61	478	242	618
1914	195	583,506	3.71	423	218	632
1915	203	557,456	3.91	443	243	655
1916	230	561,102	3.89	503	284	656

*If mines worked 300 days at same rate. (a) Statistics not collected for year 1909.

to be seen whether the mine employee will continue to increase his production per day as in the past. It has been alleged that the tremendous increase in the unit prices paid for labor has caused a drop in efficiency. If this is true, it may prevent any further increase in the daily output per employee and may militate against the increased use of labor-saving machinery. In this way the total production might conceivably be curtailed until additional miners and laborers became available.

In estimating the maximum capacity of the mines in which labor and mechanical equipment are factors, it is possible, assuming ample transportation facilities, to work the mines 300 days in the year. Some well-situated mines, especially mines owned and operated by railroads for their fuel supply, have done better than this, 310 days or over being reported. On the assumption that the rate of output for the days actually worked could be maintained for the remainder of the 300-day working year, curve 5 has been constructed. This indicates that the total possible productive capacity of the mines of the country rose steadily at the rapid rate of about 32 million tons annually, until 1910. From then to 1914 the rate of increase fell to 15 million tons, and for the years 1914, 1915, and 1916, it was practically stationary. In the chart I have assumed that it was practically stationary in 1917.

An attempt has been made to obtain figures for the number of mines which are worked out and abandoned

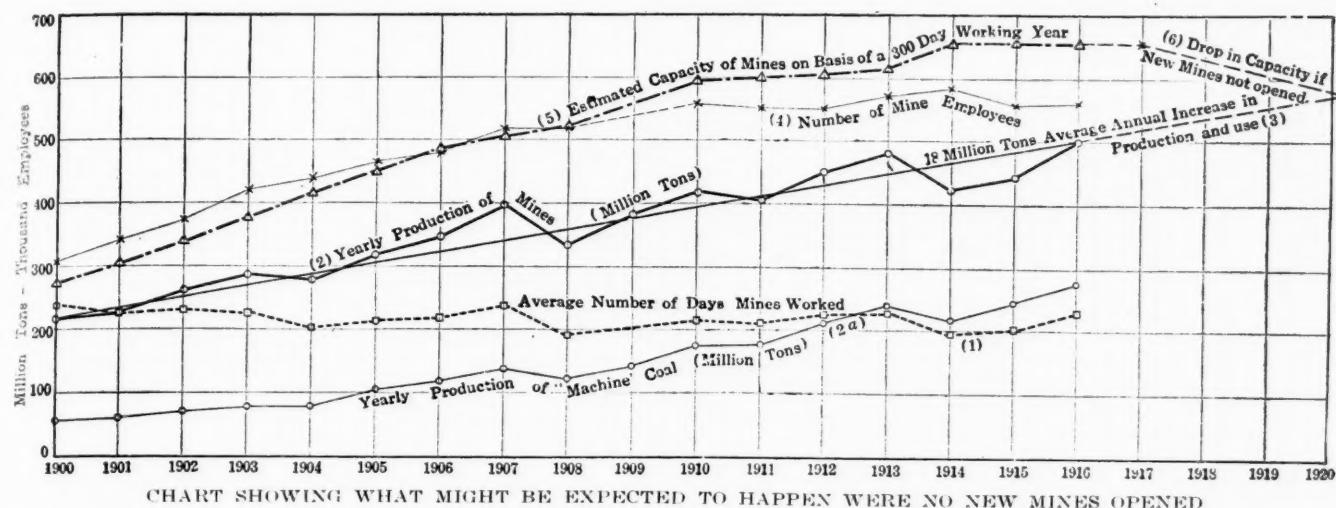


CHART SHOWING WHAT MIGHT BE EXPECTED TO HAPPEN WERE NO NEW MINES OPENED

each year but the statistics gathered have been considered unreliable. In order to arrive at certain approximate results, I have had to make an assumption of the average life-time of a bituminous coal mine. From my own experience, and that of other mining engineers whom I have consulted, the assumption has been made that the average life-time is 20 years. If this is true, then one-twentieth of the mines are worked out and abandoned each year.

The Geological Survey compiled the number of mines, and the outputs for mines of different sizes from 1909 to 1914 inclusive ("Mineral Resources"). This compilation shows that the output of mines producing over 10,000 tons annually was over 98 per cent. of the total production of the United States. The number of such mines and their output is as follows:

Year	Number of Mines with Outputs Over 10,000 Tons Annually	Total Output, Million Tons	Average Output per Mine
1909	3,721	371.6	100,000
1910	3,909	419.7	107,000
1911	3,810	397.9	104,000
1912	3,977	443.0	111,000
1913	4,027	471.3	117,000
1914	3,916	415.3	106,000

In 1913 the number of these large mines reached a maximum. If 5 per cent. of the mines were worked out every year then we are justified in assuming that 201 mines, producing 23 million tons cease production annually.

Extending the line (curve 3) representing the average annual output to 1917, figure for the total output during that year is obtained, namely 520 million tons, 5 per cent. of which is 25 million tons. This amount must be made up by the opening and development of new mines. In addition to this enough new developments must be made to provide for the natural increase in consumption, which as has been shown has steadily increased for 20 years at an average rate (see curve 3) of 18 million tons per annum. In other words, to maintain the margin of capacity over consumption enough new mines to produce 43 million tons per year must be opened in 1918 and the number of new mines opened per year must increase during the years that follow. From the foregoing it is clear that at present 400 new mines are needed per year to take care of increased consumption of coal and the exhaustion of mines now in operation.

Assuming that the maximum capacity of all the

mines on a 300-day basis was the same in 1917 as in 1916 (the capacity for 1914 to 1916 inclusive apparently being stationary), and assuming that no new mines were opened after Dec. 31, 1917, then the line 6, which indicates a drop in capacity of 25 million tons per annum, would intersect the extended average consumption line 3 in 3 years, or at the end of 1920. As a matter of fact, it is probable that the estimated maximum capacity indicated on the chart could never be quite reached, on account of transportation difficulties. Hence, if no new mines were opened after Dec. 31, 1917, it is probable that inside of 2 years, or by the end of 1919, the consumption would have to be curtailed by reason of the decrease in the capacity of the mines now shipping.

Fortunately, however, the situation was appreciated, and I understood that no legal restrictions have been placed on the opening of new mines.

Alabama Coal and Coke Production in 1917

In the following tabulation is shown the Alabama coal and coke production by counties for the year 1917 as compared with 1916. The data were furnished by C. H. Nesbit, chief mine inspector of the State of Alabama.

COAL PRODUCTION IN ALABAMA DURING 1917 AS COMPARED WITH 1916

County	1917	1916	Decrease	Increase
Jefferson	10,927,707	9,973,202	.....	954,505
Bibb	1,507,669	1,507,141	.....	528
Blount	381,777	329,693	.....	52,084
Etowah	49,929	53,407	3,478	.....
Jackson	3,266	778	.....	2,488
Marion	108,795	77,658	.....	31,137
Shelby	791,405	609,369	.....	182,036
St. Clair	842,750	771,992	.....	70,758
Tuscaloosa	919,316	959,431	40,115	.....
Walker	4,839,289	3,926,752	912,537	.....
Winston	40,938	25,202	.....	15,736
Grand totals	20,412,841	18,234,625	43,593	2,221,809
Increase in 1917 over 1916	.....	.....	.....	2,178,216

COKE PRODUCTION IN ALABAMA DURING 1917 AS COMPARED WITH 1916

County	1917	1916	Decrease	Increase
Jefferson	4,240,981	3,872,738	.....	368,243
Etowah	127,542	.....	.....	127,542
Tuscaloosa	396,843	389,372	7,471	.....
Walker	103,232	123,383	20,151	.....
Grand totals	4,868,598	4,385,493	20,151	503,256
Increase in 1917 over 1916	.....	.....	.....	483,105



Zone Plan Working Well

The zone system is functioning better than had been anticipated. The comparatively few mines which have been affected adversely have been relieved promptly. There is abundant proof that the system is elastic and that modifications developed in practice can be made quickly. The plan is being well received by operators. The Fuel Administration and the railroad management are acting in entire harmony. The railroad administration, which really had an important part in the development of the plan, seems to be more than willing that it should be regarded as purely a Fuel Administration project, with the latter organization getting all the credit and incidentally all the blame for its proper operation.

One of the difficulties which have to be overcome is that many retailers and consumers, who have been cut off from their previous sources of supply, do not know how to proceed in establishing new connections. In order that such arrangements may be made in the most advantageous way, the district representatives have been instructed to pay particular attention to lending assistance of this character. All the license cases have been acted on and work began Apr. 16 with a clean slate.

Under an order modifying the zone system of bituminous coal originating on the Pennsylvania R. R., Monongahela R. R. and Huntington & Broad Top Mountain R. R., and their short line connections, in the States of Pennsylvania, West Virginia and Maryland, when routed via the Pennsylvania R. R. is embargoed from Baltimore and Washington markets.

To meet this situation, the United States Fuel Administration will arrange for the essential supply to the points designated from mines on the Baltimore & Ohio R. R., the Western Maryland R. R. and their connections, which lines afford a much more direct route to these points. As a consequence, a vast amount of time and mileage will be saved to the Pennsylvania lines, thus assuring an increased movement of coal to points in eastern Pennsylvania, New Jersey and New England.

Consumers of the classifications named in Preference List No. 1, of the Priority Board, will receive coal in preference to any other individual or class of consumers.

Under the modified order, which will become effective on Apr. 20, producers in the sections named will be prohibited from selling, shipping or distributing coal to dealers and consumers at Washington and Baltimore and at all stations on the Baltimore & Sparrow Point R. R., when routed via the Pennsylvania Railroad.

The order forbids the shipment of bituminous coal over the railroads named for railroad delivery or transhipments to vessels in Baltimore, at President St., Highlandtown, Jackson's Wharf, Calvert, Bolton, Frederick Road and Gwynns Run Station, and points of delivery between any two of such stations; all stations and points of delivery on the Baltimore division of the Pennsylvania R. R. from Loudon Park, Md., to Catonsville, Md., inclusive, and Arbutus, Md., to Washington, D. C., and Rosslyn, Va., including Popes Creek branch running from Bowie, Md., to Pope's Creek, Md., inclusive.

Consumers located on the Pennsylvania R. R. and Baltimore & Sparrow's Point R. R. will continue to receive their coal at their regular points of delivery, the coal moving via the Baltimore & Ohio and Western Maryland being delivered to the Pennsylvania R. R. at junctions near destinations.

Railroad Fuel Situation

While a deadlock exists in the railroad fuel controversy, the Fuel Administration gained a great advantage last week when the President, himself, ruled out assigned cars. From the developments of the week, it is apparent that the Fuel Administration is determined to stand by its contention that coal must be sold to all consumers at the same price. The price-fixing policy has been conducted on that basis. The purchasing agents of the railroads, however, are not willing to relinquish the advantage that they hold in being large consumers and are insisting that they get coal at the lowest price they can squeeze from the operator.

Finding that the Fuel Administration is an obstacle of consequence to the carrying out of this plan, the railroads have stated their willingness to purchase coal at cost plus 10c. a ton. There was a rumor current in Washington last week that this proposal came from the President after the matter had been laid before him. The rumor proved to be unfounded, however. It is generally understood that it was the President himself who insisted that the prices fixed on various commodities are to be the same to the Government and to the public.

One effect of the activities of the Fuel Administration in this matter has been to bring to its support many of the operators who have been antagonistic to it. In fact, the confidence of operators generally in the Fuel Administration has increased.

The action of the railroads in withholding purchases is having an untoward effect on the general fuel situation. Every effort has been strained to remove doubt

and uncertainty during the new coal year. It now has come to be generally known that the price regulations are not going to be revised downward and, as a result, one of the confusing uncertainties of the last coal year has been removed. It is a cause of deep regret at the Fuel Administration that the action of the railroads should have injected a new uncertainty into the fuel situation.

Weekly Production Statistics

A drop of 14 per cent. in the bituminous coal production took place during the week ended Apr. 6. Telegraphic advices indicate that most of the loss was recovered during the week ended Apr. 13, but the production still will be under that of the week ended Mar. 30. The observance of Apr. 1, the anniversary of the enactment of the eight-hour law, is responsible for a portion of the poor showing.

Anthracite forwardings, during the week ended Apr. 6, totaled 32,232 cars, or 11,410 cars less than were forwarded during the week ended Mar. 30.

Beehive coke production declined 4 per cent. during the week ended Apr. 6, as compared with that of the week preceding. The total production for the week was 624,000 tons. Byproduct coke production totaled 466,324 tons.

Some Industries To Receive Preference in Coal and Coke Supplies

By instituting a priority policy in the supply and distribution of coal and coke, the War Industries Board has taken a step which will be far-reaching in its results. The priorities division of the War Industries Board has issued preference list No. 1. Speaking of this list, the Board says:

While the list speaks for itself, it is proper to say that the Board has not undertaken to classify any industry as nonessential or at this time to limit the quantity of fuel which any particular industry or plant shall receive. The Board has, however, listed certain industries whose operation is of exceptional importance measured by the extent of their direct or indirect contribution either toward winning the war or toward promoting the national welfare, and these industries will be accorded preferential treatment by the Fuel Administration in the distribution of coal and coke and also in the transportation of such coal and coke by the railroads.

This same plan will be followed in according preferential treatment to war industries and plants in the transportation of raw materials and supplies required by them in their manufacturing operations, so that they may not be delayed or hampered in complying with priority orders issued against them governing their products.

The following industries and plants are to be given preference in the matter of coal and coke supplies:

Plants engaged exclusively in manufacturing aircraft or supplies and equipment therefor; plants engaged in the manufacture of ammunition for the United States Government and the Allies; Army and Navy cantonments and camps; plants engaged in manufacturing small arms for the United States Government and for the Allies; plants engaged exclusively in manufacturing chemicals; coke plants; domestic consumers; plants manufacturing electrical equipment; plants producing electrodes; plants manufacturing explosives; manufacturers exclusively of agricultural implements and farm operating equipment; plants producing feed; plants producing ferro-alloys; manufacturers of fertilizers; plants producing firebrick exclu-

sively; plants manufacturing, milling, preparing, refining, preserving and wholesaling food for human consumption; manufacturers of tin and glass containers and manufacturers exclusively of other food containers; gas-producing plants; plants manufacturing exclusively gas-producing machinery; plants manufacturing large guns; plants manufacturing exclusively hemp, jute and cotton bags; manufacturers exclusively of insecticides and fungicides; blast furnaces and foundries; laundries; plants manufacturing machine tools; mines; plants engaged exclusively in manufacturing mining tools and equipment; plants printing and publishing exclusively newspapers and periodicals; refineries of both mineral and vegetable oils; plants manufacturing exclusively oil well equipment; public institutions and buildings; public utilities; railways; plants manufacturing locomotives, freight cars and rails, and other plants engaged exclusively in manufacture of railway supplies; refrigeration for food and exclusive ice producing plants; producers or wholesalers of seeds (except flower seeds); ships (bunker coal), not including pleasure craft; plants engaged exclusively in building ships (not including pleasure craft) or in manufacturing exclusively supplies and equipment therefor; manufacturers of soap; steel plants and rolling mills; tanning plants save for patent leather; plants manufacturing tanning extracts; manufacturers of tin plate; plants producing exclusively binder twine and rope and manufacturers of wire rope and rope wire.

Regulations Covering Bunker Coal

To insure greater speed and a greater steaming radius, bunker coal is to be limited to the smokeless variety. Regulations governing bunker coal are as follows:

At Atlantic ports, north of Cape Hatteras, at which all tidewater coal is pooled and delivered through the Tidewater Coal Exchange, permissible bunker coal is specified as follows:

At Hampton Roads—Coal originating in the Pocahontas and New River fields which have been or may be classified by the Tidewater Coal Exchange for consignment to Pool No. 1 or Pool No. 2 at Lambert's Point, Sewall's Point or Newport News.

At Philadelphia, New York and Baltimore—(a) Coal originating in mines on the acceptable list of the United States Navy, which has been or may be classified by the Tidewater Coal Exchange for consignment to Pool No. 1.

b. Coal originating at mines on the New York Central R.R., on the Pennsylvania R.R. or any of their connecting lines, which has been or may be classified by the Tidewater Coal Exchange for consignment to Pools Nos. 9 and 10.

c. Coal originating at mines on the Buffalo, Rochester & Pittsburg R.R. which has been or may be classified by the Tidewater Coal Exchange for consignment to Pool No. 14.

d. Coal originating at mines on the Baltimore & Ohio R.R., Western Maryland R.R. or any of their connecting lines, which has been or may be classified for consignment to Pool No. 22.

At ports north of New York which receive their supply of coal from New York, Baltimore, Philadelphia or Hampton Roads, coal for steamship use is to be supplied from the permissible list as herein specified.

F. J. Herman has severed his connection with the estate of W. J. Rainey in order that he may give his full time to his work as chief assistant to W. S. Blauvelt, coke director of the Fuel Administration.

A deficiency in the supply of blacksmith coal has been reported to the Fuel Administration. Since producers are not allowed to make an extra charge for coal of this character, it apparently is not being loaded in sufficient volume to meet the demands.

It's our war and we must win it. Do your bit by buying LIBERTY BONDS.

THE LABOR SITUATION

General Labor Review

This week the main event to record is the telegraphic protest of the United Mine Workers on Apr. 13 against any further reconsideration of prices by the United States Fuel Administration on the ground that when prices are raised the mine workers become restless and when they are lowered many mine workers working at plants of inferior efficiency are laid off. Assuming that the first prices established by the Fuel Administration, in the hurry of the first days of its inception, were perfectly just, there is no logic in the establishment of new prices.

But the Fuel Administration admits that it did not have until now any costs of production from which it could adequately arrange a price schedule. Guesswork is now giving place to knowledge. The old prices were recognized as unscientific, but that mattered little when no coal was obtainable at the prices set. So long as all coal was sold on earlier contracts the prices of the government were a future menace or a pleasing prospect, as the case might be, but nothing more.

UNION COMPLAINS OF THE MANY IDLE DAYS

This telegram of the United Mine Workers declared that mines in Iowa, Oklahoma, Missouri, Kansas, Colorado, Wyoming, Montana and West Virginia are working less than half time. It did not, however, explain just why this fact is more distressing in those states than in some others where the working time is as short, but it may be assumed that the union singles out these regions because it believes that the reason for this slow run is, in part, due to the prices which have been established for them. The telegram added that many large mines are actually shut down. It then goes on to say that the men are leaving the mines and "if this exodus of miners to other lines of employment is permitted to continue, even though full-car supply and the most satisfactory distributing facilities are provided later these provisions will fail to relieve the situation."

The communication then asserts that the miners are ready to dig all the coal the nation can possibly use and declares that they are "able and eager to break all records in coal production and distribution (sic?) if given the necessary facilities and coöperation." It goes on to say:

DECLARES UNION HAS BOUGHT \$2,000,000 OF BONDS

"The best evidence of this fact is the record of production of 1917 under the most trying circumstances. The international, district and local organizations have subscribed for approximately \$2,000,000 of the three Liberty Bond issues. We want to help with all our force in the present crisis—not hinder. But the outlook for an adequate coal supply is of such grave concern that we must, for the protection of the mine workers and as a public duty, call your attention to what we are constrained to believe is a menace to the hope of providing sufficient coal.

"Almost every day coal prices are changed in the whole or part of some state. Distributing agencies are annulled as they exist, or restricted, or so completely changed as to upset every stable calculation. Whenever the prices are lowered in any state the operators affected immediately ask for a hearing. This invariably results in decreased production until the operators' appeals are definitely determined. When prices are raised the coal miner naturally feels that he should receive a proportionate amount of such increase. This condition has created an unrest that nothing short of a stable, permanent price arrangement can satisfy.

"The coal miners feel that they have not had that degree of consideration in adjusting the affairs of the industry and the promulgation of policies that rightfully is theirs. Therefore we feel it our duty to ask of the Fuel Administration that a greater degree of consultation be given the half million of our members through the organization's representatives in order to promote the most efficient and effective coöperation."

In the anthracite region, especially around the Panther Creek Valley the miners are using coercion to induce every mine worker to buy Liberty Bonds. On Apr. 11 the mine workers at No. 10 mine of the Lehigh Coal and Navigation Co. refused to go to work till a German miner of their number had been induced to sign for the purchase of a bond. At No. 8 colliery a Hungarian, with a decidedly pro-German bias, who refused to buy a bond was compelled to do so and also forced to kiss the flag. The mine workers do not want any "Liberty Loan slackers," and are determined that at every colliery every employee shall buy a bond. At some collieries this aim has been fulfilled.

On Apr. 9 a small strike occurred at Young's Landing, near Pottsville, Penn., because the loaders at the Taylor culm-pile were required to do increased work without additional pay. The firm is loading culm for the New York City markets for admixture with bituminous coal. The men were receiving \$2.40 a day for loading six 2-horse wagons with culm, the culm being hauled a short distance to the nearby freight station.

MALCONTENTS NOT NUMEROUS IN HARD-COAL REGION

On Apr. 12 the Tridistrict Board of the United Mine Workers of America in the anthracite region met and issued an appeal to the mine workers to buy Liberty Bonds. The board took no action on the dissatisfaction in the Shenandoah field in relation to the increase in dues decreed by the international convention. The promise of an independent union does not seem likely to materialize. In the future the legal department of the United Mine Workers of America, of which Rogers Devers, of Wilkes-Barre, is head, will have the assistance of qualified physicians and surgeons in presenting testimony to the compensation board and referees.

There has recently been quite a general unionization of the Georges Creek field where William Diamond, former international statistician of the union is president. The men went on strike Monday, Apr. 16, for higher wages and recognition of the union. William Diamond was called to Washington, D. C., by H. L. Kerwin, the head of the bureau of conciliation and mediation of the Department of Labor.

GEORGES CREEK STRIKE ENDS IN A FEW HOURS

The Government promised to adjust the differences and the Fuel Administration issued a notice that it would not treat with the mine workers while they remained on strike. As a result 2000 men returned to work early on Wednesday, Apr. 17, and 4000 more men during the course of the day. The strike involved not only the Georges Creek, but the Upper Potomac, region also. Among the more important firms affected were the Consolidation Coal Co., the Black-Sheridan-Wilson Coal Co. and the Davis Coal and Coke Co.

West Virginia has been quiet except for a strike at the Minden mine of the New River & Pocahontas Consolidated Coal Co., a Berwind-White affiliation in the New River region. The men at the mine struck because they objected to the assistant mine foreman, but the trouble has been finally settled through the State Department of Mines.

The Illinois mine workers are still endeavoring to Americanize those whom they suspect of pro-Germanism. Probably nothing so severe as lynching is purposed, but violence, like other vicious practices, feeds on its own fires. Prager's death, let us hope, and the action of the grand jury at Edwardsville, in presenting a true bill against five of Prager's alleged murders, leading among whom is Joseph Riegel, will subdue a spirit which should never have been allowed to arise. It is expected that the grand jury will indict some 40 others. It is generally felt that Prager was a better man than his tormentors.

The Marvel mines, of the Roden Coal Co., in Alabama recently had a partial suspension of work, but fortunately a temporary settlement has been reached and the mines are now operating with full force. H. G. Selheimer will act as umpire to consider and determine as to what should be done relative to the demands of the miners.

To turn to eastern Canada, a labor convention recently met in Sydney with delegations from all the various labor unions in the province of Nova Scotia. It instructed the executives of those unions to draft a bill to be presented to the House of Assembly for enactment. This bill will force corporations to recognize the labor unions of the men's choice.

In Alberta a strike occurred Apr. 9 among the men employed at the Federal Coal Mines near Lethbridge. The men struck to prevent the discharge of an Austrian agitator. The company refused to reinstate this man. The mine workers declare, and the manager denies, that the contract is violated by the discharge of this employee.

In Nanaimo, Vancouver Island, British Columbia, the Western Fuel Co. recently announced an advance of 50c. a day which took effect Apr. 16. The increase applied to all the 1500 employees underground and to the surface workers. The payroll is thereby increased some \$20,000 monthly.

Salute the Flag or Quit the Work

No miner can enter the St. Louis & O'Fallon Coal Co.'s No. 1 mine in St. Clair County, Ill., without saluting the United States flag. Recently Thomas Simpson, a mine examiner, found a bottle in the mine which contained what seemed to be a dangerous explosive. When the miners heard of it they called a special meeting and adopted resolutions declaring that their loyalty was brought into question, and that it was their duty to demonstrate that they were loyal. To this end a committee was appointed to place a flag at the pit entrance and post a guard there to see that every man entering the mine saluted it. The resolution also called upon all employees of the mine, including in this unnaturalized men, to buy at least one Liberty Bond.

Belleville miners, in the same county, have voted that they will go no further with plans for the erection of a Labor Temple, on the ground that patriotism requires them to put into Liberty Bonds the money which would be needed for the erection of the temple. Employees of the Superior Coal Co., near Belleville, subscribed for almost \$10,000 worth of bonds. One miner bought \$1200 worth and several others took \$500 worth each.

Even the Spirit Is Unwilling

The "jumpy" condition of the Illinois miners, due to a number of recent mine explosions, believed to have been caused by disloyalists, was shown when 450 men employed in three mines near O'Fallon, Ill., refused to work on Saturday, Apr. 13, on account of a "spirit message" received by one of the men, Elmer Birch, who is employed at the Taylor mine. This message came in the form of a telegram Saturday morning: "This is warning. Don't go to work Saturday thirteenth. There is an accident for you if you go. Don't think this is fun. Grandpa said there would be an explosion, and listen to this. Letter will follow. Mamma." It was sent from Kansas City, where Birch's mother lives. She is a spiritualist and the "grandpa" referred to is her deceased husband. When the 200 miners employed at the Taylor mine heard of the

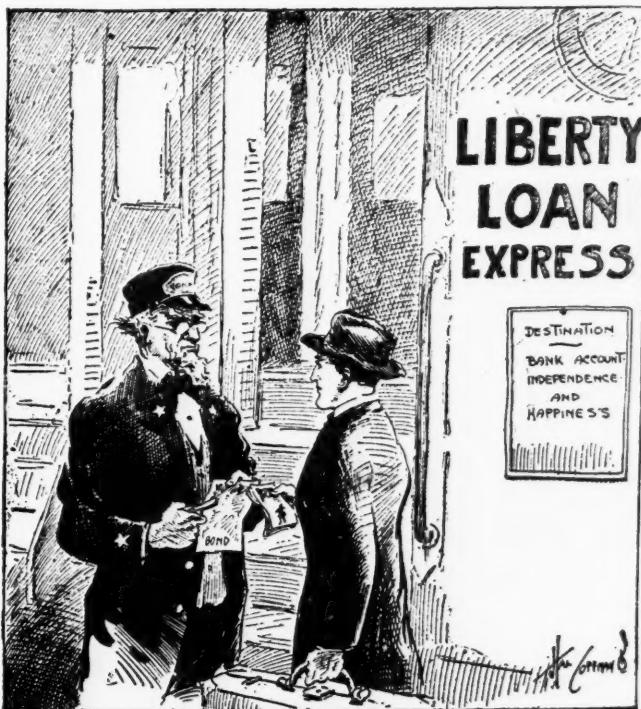
message they refused to work. Two hundred employed at the Yoch mine and 50 at the Angell mine heard about it and also refused to go down. Federal officials were asked to make an investigation.

An explosion in the Shoal Creek mine at Panama, Ill., which is situated in the Springfield district, occurred on Friday, Apr. 12, and caused such damage that the mine was temporarily closed. It happened before the men had entered the mine, and is believed to have been of I. W. W. origin. As already stated about two weeks ago a number of sticks of dynamite were found in the shaft, with a burned-out fuse attached. Since that time some of the miners have refused to return to work.

Battles Between Loyal and Disloyal

The recent lynching of Prager came as the culmination of a period of disorder and violence in Illinois. Most of this disorder was not of an extremely harmful character, but the authorities were always afraid that it might result in an outbreak, of which the state would be heartily ashamed.

It is probable that some of the "direct action" of the Industrial Workers of the World was caused as much by a desire for retaliation as from undiluted pro-Germanism.



The men who were compelled to kiss the flag one day in abject simulation of Americanism may well have been the men who a few days following were seeking by violence "to break even" with those who tried to make them simulate a virtue that they did not possess.

A review of the events leading up to the lynching of Prager, which has brought apprehension both to loyal and disloyal, is for these reasons quite timely.

The trouble started at Staunton, Ill. The disloyalists were not satisfied with performing disloyal acts, but they tried to get the loyal men to pay for their disloyalty, and it was just there that all their plans went awry and turned a lot of quiet, law-abiding citizens into a mob with which they could not hope to cope.

Severine Oberdan violated the law and was put in jail and let out on bond. His friends took advantage of the fact that union meetings were not any too generally attended, and they voted away \$100 of the local's money to defend Oberdan.

The loyal men, when they heard of the misuse made of the local's money, seized and tarred and feathered Oberdan and Metzen, his attorney. They then invaded the homes of the disloyal and made them kiss the flag and take an oath of allegiance.

Starting in this way, the disorder spread to Mt. Olive, Hillsboro, Nokomis and Gillespie. At Hillsboro a fatality occurred as a result of the general disorder, a band of "loyalists," early on the morning of Feb. 18, storming the home of Clifford Donaldson at that town, in search of a Socialist editor. Shots were fired and Donaldson, a naval recruit, received a wound from which he died the next day. Ernest Fath, a prominent young man, and Chief of Police Emory were wounded. The editor was not found. His effects were taken from his room in another building and burned. At Nokomis and Gillespie, suspected disloyalists were compelled to kiss the flag.

LOYALISTS TOOK CHARGE OF UNION FINANCES

As the Industrial Workers of the World were completely cowed, no attempt was made by them at the later meetings of the Staunton local to have the \$100 paid which had been subscribed for the defense of Oberdan. The meeting was turned into a patriotic demonstration. All members of the union now in the service who had been dropped for nonpayment of dues were reinstated and the local agreed to keep up the necessary payments. The union appropriated \$1000 for Thrift Stamps and assessed the members 50c. a month for the Red Cross.

On Feb. 18, 500 employees of the Citizens' Mining Co., at Springfield, seized Henry Martini, their superintendent, and his two sons, and escorted them from the mine to the courthouse and made them kiss the flag, because it was said Martini refused work to a man who had been discharged from the navy for physical disability, and told him: "If you want a job, you'll have to go to the navy for it." Martini strongly denied that he was disloyal and explained that the man was not employed because there was no vacancy in the blacksmith shop, where he had been employed before. He said he offered the man other work in the mine. The men did not work Feb. 25 and about one-third remained away from the mine Feb. 26, laying themselves subject to the automatic penalty.

Later the mine workers at Bingham and Mayville took up the cudgels against those they regarded as disloyal. At Bingham there was a free-for-all fight and six men were forced to kneel and kiss the flag. At Maryville, after a contingent of drafted miners had departed for the training camp, a crowd marched through the streets carrying a large flag and several persons whose loyalty was considered doubtful were compelled to kiss it.

BUT MINERS MUST BE DISCREET AS WELL AS LOYAL

Both Governor Lowden and President Walker of the State Federation of Labor issued statements condemning the outbreaks. The Governor's statement was issued after he had been appealed to by Charles Enos, a Hillsboro miner, who said that he was loyal but had been driven away from Hillsboro. The Governor declared that mob rule would not be tolerated in any part of the state, even though it was in the name of loyalty. "If any man in any community is guilty of treason or sedition or any other crime," he said, "there are proper tribunals open for his punishment. They who take the law into their own hands at such a time are helping not our own cause but that of the enemy. Mob rule is mob rule, whatever disguise it wears."

President Walker, in admonishing union men to do nothing unlawful, said: "I again want to point out the danger of the precedents that are being established by mobs taking the law into their own hands, no matter what the motives may be, and to urge upon you in every community in the state to use your influence to keep these things from being done, for just as sure as day follows night, if these things are done by any of our members or any friends of the labor movement, the enemies of the humble toiler will use them now and in the future wherever possible to destroy our movement under the same pretext."

A survey made by P. M. Greenlaw, Secretary of the

Fifth and Ninth Districts Coal Bureau, reveals that 23.9 per cent. of the miners in the districts are subject to the draft, on the basis of returns from 34 mines. Some weeks ago Greenlaw sent questionnaires to the mining companies. The 34 replies received show that in that number of mines 7804 men are employed and 1867 are subject. Of this number, 996, or 12.7 per cent., are in Class 1.

Successful Cooperation with Labor

District No. 25, the Missouri district, the home in the past of continual labor trouble, where both operators and laborers looked at one another with suspicion and dislike, has been recently the seat of a remarkable experiment in coöperation which has proved most successful. The credit is due largely to Wallace Crossley, the state fuel administrator, who felt convinced that it was his duty to speed both mine operators and mine workers in their work of producing coal.

On Dec. 14, he brought the representatives of the United Mine Workers of America and those of the Southwestern Interstate Coal Operators Association together. The aim of the mine workers in meeting with the operators was not to get more wages or more satisfactory working conditions, but to coöperate with the operators in the production of more coal and to seek a way of settling troubles with a minimum of disturbance to industry. They met with a will to peace and progress rather than with a will to disorder and disagreement.

War efficiency committees were provided at each mine. The Coal War Board makes general suggestions as to the manner in which the mine shall be conducted in the interest of safety and of efficiency of operation. It hears complaints and receives suggestions from the miners and operators. The war efficiency committees at each mine are composed of the mine superintendent and foreman and a committee of mine workers, and until recently they met weekly or more often to consider safety and production needs. The present slackness of operation, however, has made these meetings unnecessary.

As long as the mines were working, the mine workers who took part in such war efficiency committee meetings were paid for their time, the expenses being shared between the mine workers and the operators.

There have been many instances where the war efficiency committees successfully solved difficulties that might have resulted in serious conflicts, and it is certain that strikes have been prevented. As a result Missouri has been freer from strikes than at any prior period, the mine workers have been patriotic and loyal, and production has been maintained at a high level.

Much of the credit must be given to D. A. Frampton, the president of the district, who has worked zealously in promoting the aims of the Coal War Board, and it must not be assumed that activity on his part was unnecessary. There has been possibly as much scrapping as ever, but there have been few strikes.

Coming Meetings

CANADIAN RETAIL COAL ASSOCIATION will hold its 14th annual meeting Apr. 25 and 26, at the King Edward Hotel, Toronto, Ontario, Canada. Secretary, B. A. Caspell, Brantford, Canada.

AMERICAN ASSOCIATION OF ENGINEERS will hold its fourth annual convention May 14 in Chicago, Ill. Secretary, A. H. Krom, 29 South La Salle St., Chicago, Ill.

NATIONAL COAL ASSOCIATION will hold a meeting May 8 at the Bellevue-Stratford, Philadelphia, Penn. Secretary, J. D. A. Morrow, 707 Southern Building, Washington, D. C.

ILLINOIS MINING INSTITUTE will hold its next meeting May 23, 24 and 25, at Peoria, Ill. Secretary, Martin Bolt, Springfield, Ill.

What Doth It Profit a Man?

Germany is working, by every scheme that ingenuity can devise and money can put into operation, to make American workingmen traitors to their country in its hour of need.

What Doth It Profit a Man

if he sends his sons and brothers to the battle-fields, and after he gets them there he betrays them to the enemy by stopping the industrial home work without which they can neither win nor escape?

The courses of nations—the lives of millions—are changed by very small events. Had the Monitor not been ready for the Merrimac exactly when she was, the Union fleet would have been rendered useless and the Civil War might have had a different ending. Had someone then succeeded in making serious trouble in a mine, a foundry, or a shop—had someone then succeeded in delaying transportation while the Monitor was under construction, what would have become of the whole Union fleet of wooden ships which was blockading the Southern ports?

Germany wants us to be unready or confused when a similar crisis comes.

Our whole nation is preparing for the turning point in this war which is to determine whether every man shall have a chance to work out his destiny, or whether he and his country are to become subject to the dictation of a Prussian group.

If we are not fully ready when the test comes it will be easier for German armies and German ships, German submarines and German aircraft, to kill the men that go out from your community to protect you and your rights.

Whoever from any motive delays work bearing directly or indirectly on the war will be an accessory to the murder of his fellow Americans.

Every strike in the United States, while this war is in progress, is a blow in favor of Germany.

What Doth It Profit a Man

—to increase his wages or decrease his working hours if by so doing he contributes to the victory of a nation that makes slaves of white men and scourges them as they work? The condition of the blacks in America before the Civil War was far better than the condition of the whites of Belgium who today are carried off like cattle, are over-worked, underfed, beaten and, sick or well, must labor incessantly, often under the fire of their own guns.

What Doth It Profit a Man

—to aid a monarch who in this manner has shamelessly re-established the slavery of white men? The workingman in America who obstructs the cutting of wood, the mining of fuel, the weaving of cloth, the turning of wheels in factories or on rails while this war is in progress—he is helping the slave masters, the destroyers of civilization, the murderers of women and children.

Stand by your work for your own honor and safety, for the safety and success of your fellow countrymen who go forth to fight, as well as for the sake of workingmen who are now in actual slavery beneath German slave drivers

What Doth It Profit a Man

—who has lived in a land of incomparable liberties, of advantages unparalleled in all the history of the world, to contribute by any act, however small, to the success of an autocracy to whom a common man is but a clod of earth? The workingman who stands faithfully by his duties day by day, allowing no person and no thought to get between him and an honest performance of his work, is rendering the highest kind of patriotic service to his nation and to his family.

What Doth It Profit a Man

—to sell his manhood, his self-respect, perhaps his soul, for a little selfish gain in such an hour? When life's services are measured up at the end, those who have faithfully labored through the war shall be entitled to their credit as well as those who have led the charges in battle.

What Doth It Profit a Man

—who wants to improve the condition of laboring men if he gains a little but in so doing prolongs the slavery of Belgian workingmen, who now cannot gain their freedom but by death, or through the victory of the Allies?

CONFERENCE COMMITTEE ON NATIONAL PREPAREDNESS

Metropolitan Life Building, One Madison Avenue, New York City

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EDITORIALS

What Is Needed from the Wage Earner

THE Third Liberty Loan has one powerful competitor, the Collector of Internal Revenue. Probably the loan would have been much bigger if William G. McAdoo had not realized that those who are paying phenomenal taxes, roughly four and a half billions of dollars, cannot buy Liberty Bonds at the same time, for the loan and the taxes together will reach the phenomenal sum of seven and a half billion dollars.

The bulk of the Third Liberty Loan must be carried by the untaxed and lightly taxed people of the country. Those who pay only a few per cent. on their yearly incomes may be classed with the untaxed so lightly will their burdens rest upon them. To all such the appeal is particularly pressing. Such people must not be content to buy bonds equal to 7½ per cent. of their yearly income, which would be their share if there were no taxation, and this for three reasons: First, because the larger incomes will be considerably hampered by large taxes; second, because more than three billion dollars is desired, and third, because in any voluntary collection of dues, loans or contributions, some supererogation is necessary to make up for the under subscriptions of the less liberally minded. It is for this reason that every wage earner who does not have special obligations at the present moment should feel it incumbent on him to buy bonds equivalent to 10 or 15 per cent. of his yearly income. This he should pay before the next loan is floated so that he will be able to do his duty again when the opportunity is afforded.

General Leonard Wood recently said that twelve million men were battling on the front in France. If the numbers are equally divided between Germans and Allies each will have six million men. The killing of a million Germans, which would be a tremendous victory for the Allies, almost more than they could hope for, and the arrival of a million or two Americans on the field will not turn the tide of battle.

If, as stated some time ago, and as seems probable from recent developments in the field, the Allies are much less numerous than the enemy, then the recent slaughter and the arrival of American troops will do little more than restore the balance. Looking at it from this point of view the case would be desperate were not the defense so much stronger than the offense. But this fact puts the final victory further off. We must look for a long war and for sacrifices far greater than we have yet faced.

In the past year we have spent on *our own* conduct of the war about four billions of dollars, about one-third of what we expected to spend. In the second year of the war now just commenced we shall be organized so that more can be spent. Perhaps we shall eventually reach such a state of efficiency that twenty billions will represent our capacity for warfare. When we do, the war will end but it is hardly possible that it will end before that time.

What's Wrong With the Mines?

AN INCREASE of 21 per cent. of fatalities in 1917 as compared with those in 1916 is a severe blow to our self-esteem, and not an easy one to explain. Certainly the increase in tonnage of 10 per cent. does not explain it.

The foreigner, on whose broad shoulders most of us delight to lay the blame for accidents, is surely able to prove an alibi. For is it not true that for some few years foreigners have not been coming across the water and entering our mines? A few Mexicans perhaps have joined our laboring forces, but surely few others made acquaintance with our mines for the first time during the past year. Probably at no time within a half century have our mines been operated by a larger percentage of Americans than today, and yet we are confronted with more accidents than ever!

Is it more general labor turnover that is the cause of the increase of accident frequency or is it the spirit of unrest, absent-mindedness or discontent? No one seems to know. A few facts about the relation of labor turnover to accidents are, however, timely and may shed some light on the subject. J. S. Herbert, of the Cambria Steel Co., speaking at the National Safety Council's Congress in 1917, said that he found that in the latter part of 1914 the accident record, which had been falling, began suddenly to mount, and the safety engineers were disposed to dodge the general manager till they could find out just why.

Investigation of the records showed that the new men, those who had been employed for less than 30 days, were 12 times as liable to injury in an iron and steel plant as the men who had been employed for a longer period of time. The breaking-in time broke the workmen. Till he had memorized the hazards and sensed the dangers of the plant he was 12 times as liable to accident as he was afterward.

This, then, is the naturalization which is mainly needed for safety—an introduction to the dangers of the plant. While the men who had 30 days of training in the specific dangers of the Cambria plant and in the perils of iron and steel plants in general had an average loss of time of 0.13 day per month, the men who had been at the plant less than 30 days lost on an average 2.41 days in the same period. The relative loss of time is 19 to 1. The accidents suffered by the new men, as just defined, were more serious than those from which the old hands suffered, for only 14 per cent. of the older employees who were injured went to the hospital, whereas 41 per cent. of the new men so injured had to receive hospital treatment.

Mr. Herbert was able to report that by helping the new man to accommodate himself to his environment the Cambria Steel Co. had cut the relation of the hazard of new men to old from 12 down to 6. Some plants, perhaps the Cambria Steel Co. also, have a man known as the "plant preacher." He takes the new man to his

work by the nearest route, shows him all the dangers on the way and the perils of the work, and tells him that the company has an interest in his safety and welfare.

In contradistinction to this kindly method of treatment compare the method at some mines where the miner is told off to some other miner or a driver, to be shown the way to room 25 on the 16th left. All he is shown is his place. He has absolutely no introduction into the dangers of the mine.

Perhaps, as stated, labor turnover is not the source of increased fatality rate, but no one seems to know as yet what is the real cause. But in any case it would at least pay us to take a little more care with the new man and not leave his training to the spare moments of a foreman who is probably not a good teacher. Most of them are not skilled in the work and do not have the time.

The "plant preacher" is chosen, not for his power of getting work out of men or for directing operations, but for his power of visualizing the other man's needs and gaining his co-operation in safety and in other like matters. He is the employee's friend, not his boss. The difference is not in mere words, and his mediatorial work may well stave off many a difficulty as well as many an accident.

Expansion is the life of the royalty trade. The house of Hohenzollern has done some pushing in Europe. A LIBERTY BOND bought now may act as a stone wall to their designs on America later on.

Germany Never Was a Paradise

THE greatest propagandists of all times have been the Germans. No one could state a half truth or an untruth with more appearance of passionate conviction. In fact, like most deceivers they were probably themselves the most deceived. The most skillful of all Germany's press agents were those who had been long domiciled among us. Strange to say with some men, the more remote their connection with their fatherland or motherland—German or other—the more worshipful their regard becomes.

Those who never lived or worked abroad, and those who left many years ago have no touchstone of experience. They can believe all they please without restraint. They can magnify single instances into the broadest generalizations, and again, they can minimize a general condition into an unimportant instance, as the fancy pleases. The foreign country is like an earlier age, not an object of sense but of the mind; not something actually experienced, but something merely imagined.

It was these men, with a sort of nostalgic dementia, who thus idealized Germany, who misrepresented it to America, who made us confuse "kultur" with culture. The less they actually knew, the less their imaginations were hampered. It must be admitted that Germany really had the symbols of some extremely pleasing institutions, both political and sociological, as for instance, the symbols of a parliament, of a freedom of thought and utterance, of a farm-loan provision, of an old-age pension system, of unemployment insurance, of

accident compensation and accident prevention, of model housing and so forth.

That they had the symbol and not the institution itself made it quite easy for the Germans in America, and especially for the children of Germans in this country, to think over well of their fatherland. It is not the intention here to take up political matters, but a few sociological facts presented by the League for National Unity are interesting.

Coal miners averaged \$334 a year in 1907; lignite miners, \$297; salt miners and salt workers, \$309; copper miners, \$271 and iron miners, \$266. Yet in Germany the mine workers usually worked every day and for long hours.

The average invalidity pension was \$46.51 a year—less than \$1 a week. The average sickness pension was but little more, \$48.45 a year. It was still as much less than \$1 a week as eleven months is less than a year. The average old-age pension was \$39.75 a year, about 76c. a week. Just imagine staying out of the poor-house to starve to death on 15c. a day or 5c. a meal, not to mention, of course, rent and clothing.

But the pensioners had nothing to complain of. Compared with pensioned widows and widowers they were grossly overcompensated. For the aforesaid widows' and widowers' pension was \$18.49 a year, or about 35c. a week or 6c. a day—just 2c. a meal without charges for rent or clothing. The average widows' sickness pension was \$18.59 a year, and the average orphans' pension \$19.07 a year. This in a country where the poorest paid adult needed at least \$140 to \$155 a year for the cost of the barest subsistence.

The German government certainly showed its efficiency in ducking its obligations to its more unfortunate citizens, who in America would have been far more adequately supported by the local authorities.

Until the beginning of the war the highly skilled workers of Germany worked 57 to 60 hours a week. In other trades 12 to 14 hours were the rule. Hours of labor in Germany, at least in 1908, were 10 to 12 per cent. higher than in England and 10 to 34 per cent. higher than in the United States.

As a result of the low wages women and children were more generally employed than is customary in the Anglo-Saxon countries. In 1914, before the war made the labor of women common, 7265 women and 51,290 children worked in the salt mines. In Berlin, according to Ambassador Gerard, 55 per cent. of the families live in one room. Workingmen quite usually live in a two-room flat, and in these flats are crowded four to six persons of the family and lodgers besides.

Germany is a land for the imagination to idealize and for the workman no place to live in. It never was a paradise for the workingman. When you see the citizens from a foreign land work hard, save money, live in narrow quarters, easily satisfied with conditions, enduring, persevering, you may be sure they come from a place where these qualities have become ingrained from long necessity. Without the severe culture of penury the virtues described would never flourish.

Don't TALK about winning the war. Help to win it. If you cannot fight, help the boys to do it. Feed them, cloth them, give them guns and shells. You can do this by buying LIBERTY BONDS.

DISCUSSION BY READERS

Loading and Shipping Clean Coal

Letter No. 2—Reference has been made, in *Coal Age*, to the shipping of an inferior quality of coal and the Daily Press reports plants as being compelled to shut down because they have been unable to raise steam with the coal sent them. In these anxious days when the conservation of transportation facilities means so much to the country, the shipping of slate and rock for coal is nothing more nor less than an act of treason.

While it would be unfair to charge this condition to dishonest shippers, there can be little doubt but that it arises from carelessness and a lack of mine discipline. A false sense of fairness to their miners, or a false sense of patriotic duty to speed up the production of coal, may have caused some operators to neglect the means necessary for the proper preparation of their coal for market.

It can be stated without hesitation that there are comparatively few mines in the country working under conditions that make it next to impossible to avoid the shipment of dirty coal. When due attention is given to the proper separation of coal from its impurities, by the miners at the working face, and the suitable preparation of the output of the mine for shipment, there is seldom any excuse for sending an inferior quality of coal to market. The trouble can generally be traced to the miner. It does not take many miners, in an average size mine, to render the output of an otherwise good grade of coal almost unfit for market. A half-dozen men loading dirty coal throughout the day will destroy the quality of the entire output.

NO EXCUSE FOR SHIPPING IMPURE COAL

In normal times, especially if the market is dull and competition keen, more attention is given to cleaning the coal and preparing it for market. This fact is proof sufficient that it is possible to give the same attention to the loading of clean coal, at the present time, when this is demanded for the welfare of the country instead of the reputation of the mines.

There are always some miners who cannot be reached except by the most drastic remedies. If not watched closely and made to suffer for the violation of rules, they will load dirty coal whenever opportunity offers. They are paid a high price today for every pound of coal sent to the surface, and there is good reason why they should perform their work well as a patriotic duty. On the other hand, the operator is responsible for permitting the loading of dirt and refuse with the coal. It is his duty to weed out these undesirable loaders, even though it may be found necessary to discharge half a dozen of them, which would show the company's determination to stop the practice in the mine. The loss of a few men in a mine will do less harm in the country's present crisis than to permit the shipment of an inferior quality of coal, which would tie up plants

and factories and delay the sailing of ships from our ports.

Every mining official should be proud of the service he is in a position to render to his country in this regard. If a miner fails to consider his own interests or that of his family and persists in a practice that he knows is unpatriotic and wrong, any mine official can well afford to do without him. Let us then be true to the colors and serve the country the best way possible during the period of the war.

Thomas, W. Va.

W. H. NOONE.

Safety in Shotfiring in Mines

Letter No. 1—The recent letters appearing in *Coal Age*, relating to shotfiring in mines, have set me to thinking in regard to some of the dangers attached to the work; but, first, I want to say a few words in regard to the enemy-alien miner and what he might accomplish when insufficient restrictions are in force in the mine where he may be employed.

In many of our mines, the miners are permitted to use dynamite in blasting. In such places, it would be a comparatively easy thing for a German sympathizer to allow small pieces of dynamite to get into his coal that he loads out of the mine. It is easy to imagine what damage these small pieces of dynamite would do when the coal is burned in the furnaces of a power plant or factory. The presence of the explosive would rarely be discovered when the coal is dumped into the chute and loaded for shipment.

There are other ways, however, that dynamite can get into the coal. For example, when a miner fires a shot that is heavy at the point, he frequently employs the practice of placing a small piece of dynamite at the bottom of the hole, before inserting the charge of black powder. He uses for this purpose a low-grade dynamite and depends on the explosion of the black powder to set off the dynamite. This frequently fails, however, especially if the hole is not well tamped or the dynamite is slightly frozen. In either case, the unexploded dynamite is quite liable to be loaded out with the coal unnoticed.

EXPLOSIVE LOADED WITH COAL SHIPMENT

I recall an extraordinary incident that happened some time ago when 12½ lb. of permissible explosive was loaded out in a miner's coal and escaped notice until it was observed in the railroad flat standing under the chute where it was being loaded. The explosive was scattered through the coal, and it was a difficult matter to recover all of it with certainty. Such accidental happenings would bring an enemy-alien miner under suspicion of committing acts of which he was not guilty.

The system of employing competent shotfirers to charge and fire all holes drilled by the miners appeals to me as the safest method to adopt, and is

particularly needful at the present time. Not only would this greatly reduce the number of accidents in blasting, but more and better coal would be produced for the same weight of powder burned. Most accidents in blasting occur from overcharging or improperly tamping the holes, and these are the results that come from allowing unskilled and reckless miners to shoot their own coal.

Undoubtedly, many questions would arise in the consideration of the employment of shotfirers. These men might require to be certified by examiners appointed by the Government. Competent shotfirers would have to be paid good wages, and it would be necessary for two to work together. The charging and firing of a large number of shots by shotfirers would require considerable time. Two men could probably charge and fire, say six holes an hour, or 48 holes in an 8-hour shift. One advantage that would result in this slow rate of firing would be that the mine atmosphere would never get so hot as to invite an explosion.

Assuming that two men could charge and fire 48 shots in an 8-hour shift, and that each shot would blow down 5 tons of coal, making a total of $5 \times 48 = 240$ tons; and, say the shotfirers were each paid \$6 a shift, the cost of firing the shots would then be $1200 \div 240 = 5c.$ per ton of coal broken down.

It would be interesting to hear from others who are in charge of work where the shots are all fired by shotfirers, after the men have left the mine, and to learn the details of how the work is performed and how the shotfirers are paid. Does this system increase the cost of production, or is the expense of firing the shots charged to each miner, according to the number of holes fired in his place?

Shelburn, Ind.

R. J. PICKETT.

What Caused the Explosion?

Letter No. 1—I have read the inquiry of "Fireboss," *Coal Age*, Apr. 6, p. 645, asking for suggestions as to the possible cause of the explosion that he has described as having occurred in a mine that was not known to be producing gas, and which had been idle for a period of two months previous to the event of the explosion.

It is stated that no one was in the mine at the time, and the cause of the explosion is therefore a mystery. The mine is said to be a drift opening, having a shaft 32 ft. deep, located a short distance back from the entrance. It is further stated that the ventilation was wholly natural, there being no fan or furnace.

I agree with the suggestion in the editorial note that follows this inquiry; namely, that there was sufficient gas generated in the mine to have caused quite an accumulation in the workings, during the two months of idleness, inasmuch as the mine was not ventilated except by natural means. The amount of gas might be very small and escape detection by the lamp; and, yet, when the mine was not working this gas could easily accumulate so as to form a dangerous body of firedamp.

In addition to the suggestion made that this gas was ignited by a fall of roof, I would like to say that another possibility is the existence of a gob fire somewhere in the workings. It seems to me that this is a more natural cause of the ignition of the gas.

Let me say, in this connection, that no mine should depend on natural ventilation as the only means of circulating an air current and keeping the mine free from gas. Had this mine been ventilated by a fan, I venture the remark that there would have been no explosion. I shall hope to hear the expression of opinion from others.

OSCAR JONES.

Worley, Ky.

Surveying and Mapping

Letter No. 6—From the letters that have been written on this subject, it would appear, as F. C. Sanner has already suggested in his letter, *Coal Age*, Mar. 16, p. 517, every engineer will prefer that method with which he has long been familiar and which he considers best adapted to his use. All will agree, however, that an accurate and complete map of the inside workings of a mine, showing, besides, the surface improvements and physical characteristics of the tract, is one of the primary necessities of every well-managed colliery.

Speaking of an accurate and complete map, I do not refer to such apologies for maps as are in use at some mines, and which show nothing more than an approximate outline of the main workings, together with the various haulage roads and airways on which is marked the direction of the air current.

MINE MAPS SHOULD BE COMPLETE AND ACCURATE

Many coal operators do not see the advantage of going to the expense of making a complete map, which in time cannot fail to prove a great source of satisfaction and avoid many mistakes that would otherwise be made in the planning of the workings. A mine map may be accurate and yet incomplete. I do not wish to be understood as decrying an accurate map of this kind, since it is far better than no map at all.

The point I wish to urge is that a mine map to be of the most value must be a complete history of the mine and show the progress of the work done year by year, giving the date of each survey of the working face and showing the thickness of the coal and the elevation at different points of the seam. This will enable the manager, superintendent, or other official to observe at a glance the work that has been done from time to time.

HOW A MINE SURVEY SHOULD BE MADE

Allow me, then, to outline briefly the manner of making a good mine survey, which should be commenced by traversing the entire property so as to accurately locate all boundary lines and such physical features and surface improvements as will be of interest in the future development of the property. This survey should include the accurate location of all prospect boreholes or shafts, and show the position of any streams or other bodies of water on the property.

The surface survey should be carefully connected with the nearest section corners or other monuments, in order to enable the notes to be correctly plotted in relation to the land lines and other properties. The same survey should then be carried into the mine so that the survey underground will correspond or conform to the same meridian as that on the surface survey.

An important feature in making any survey is the careful establishment of a true meridian line, which must form the basis of this and future surveys. The instrument must be carefully adjusted before starting the survey. No reliance should be placed on the readings of the magnetic needle, which are merely used as an approximate check on the bearings of lines as determined by their azimuth or deflection angles.

The survey underground should be made by running the transit lines from station to station throughout the several entries and airways. The ribs of all entries should be carefully located by offset measurements taken at different points of the transit lines. The survey notes should show what pillars are being drawn back and what rooms are worked out and abandoned, so that when plotting the map from the notes it will be possible to show the exact condition of the workings in every part of the mine. It is often possible to tie the underground survey to that on the surface through the finding of a borehole that has penetrated the workings or an air shaft. Such an opportunity to check the accuracy of the surveys should never be missed.

Let me say, in closing, that inaccuracy in the surveying and plotting of underground workings is not excusable. Not only may an inaccurate map be the direct cause of a serious mine accident, but much valuable coal will often be lost. Millions of tons of coal have been lost beyond recovery, in the anthracite field, through the inaccuracy of mine maps that should have guided the operations of the mine. At times, I have observed mine pillars many times the thickness required for the support of the roof, while in other places they would be so small as to be crushed by the roof pressure and start a squeeze that would make it impossible to mine large areas of the coal. On the other hand, an accurate mine map means not only greater safety in the operation of the mine, but larger profits and a more complete extraction of the coal.

Kingston, Penn.

MINE SURVEYOR.

Echoes from the Mine and Camp

Letter No. 1—How frequent are the complaints and grumblings that are heard from mine workers, owing to misunderstandings and lack of sympathy between them and their employers who operate the mines. It has occurred to me that this condition is largely due to the total ignorance of mine workers of the costs attendant on the mining, loading and shipping of coal.

To the average miner, the difference between the amount paid for the mining of coal and the price at which the coal is sold on the market is the clear profit, which he thinks goes into the pockets of the operator. He has no knowledge of the overhead charges in the operation of a coal mine.

OVERHEAD EXPENSES IN OPERATING A MINE

Miners seldom stop to consider the amount the company must pay for deadwork, in the mining of the coal; the wages paid to daymen, drivers, timbermen and trackmen; the salaries paid to the monthly men, both in the mine and in the office; the freight charges for transporting the coal to market; claims for shrinkage and loss in transportation; the expense of upkeep

of buildings and equipment; and numerous other items involved in marketing the product of the mines.

It is safe to say that if the average miner were shown the monthly cost-sheet of the mine where he is working he would receive the greatest surprise of his life. At a certain small operation, for example, the cost of keeping the horses alone averaged from \$500 to \$600 a month; the expenditure for lubricating oil, grease, etc., was another \$100, besides \$1200 was paid a year for taxes and an almost incredible amount for mine timber, iron rails, bolts, splices and other mine supplies and electrical equipment.

Consider for a moment what the cost of mine timber may be with crossties 23 c. apiece, props 22 c., cross-bars 46 c., with an additional cost of 29 c. for the labor of handling and putting in place. A little reflection, on the part of the miner, in regard to these manifold expenses, which I have hardly begun to name, would soon cause him to cease from complaining that he is not getting his share of the profits of the mine.

RENTALS BARELY COVER EXPENSE OF UPKEEP

From the camp the complaint is often heard that the rent demanded by the company for the houses in which the miners live is exorbitant. The idea often prevails that these rents collected from the miner net the company a very nice income, whereas they barely suffice to cover the cost of improvements and repairs and yield a fair interest on the investment.

The welfare work conducted by many of the larger companies for the education, entertainment and betterment of its men is no small item of expense. The amount expended for this purpose brings excellent returns but they are not such as can be classed as financial profits.

One frequently hears a miner's wife remark about improvements such as playgrounds, bath-houses, etc., "Oh yes, they are nice and we enjoy them, but the company can well afford to give them to us when you think of the money they are making." However, I am frank to say that this sentiment comes more frequently from the men, as the women who have the care of their children are more appreciative of any efforts put forth in their behalf.

CLASS DISTINCTION HARMFUL TO SUCCESS

Is it not true that too many coal operators treat their employees as belonging to what they term the "mining class," because their occupation in life is the mining of coal? In the same way, the occupation of the farmer determines the "farming class" and that of the common laborer the "laboring class." But, after all, these men are all more or less alike in their sensibilities and necessities. Because their occupation is different, does not make them worthy of less consideration. It is true that their education and habits of life may differ widely, but this places a larger responsibility on those possessed of greater advantages.

It is needless and unwise for operators to claim that the miner does not need more money, for the reason that he would not appreciate the changes made for him. Or, that he does not require better living conditions than those to which he has been accustomed, claiming that he would not appreciate the changes made for his benefit. The better class of miners do like to own

their own homes and educate their children. They enjoy the same recreations and pleasures of life as their employers if these are placed within their reach.

In closing, let me say that greater progress would be made if we did not classify men and people according to their trades and occupations, in the sense that their desires, needs and sensibilities are different and call for different treatment. Let us strive to educate them to a higher plane of living, and not withhold from them the opportunities for improvement. The wage question would then not be so great a bone of contention as it is at the present time.

M. P. H.

W. Va.

Mine Cars

Letter No. 6—I have been following with great interest the discussion regarding the change of mine equipment from plain to roller bearings for mine cars, which started with the letter of L. B. Paul, *Coal Age*, Feb. 16, p. 346, and would like to add a word or two expressing my own view.

The consensus of opinion among the correspondents who have referred to the letter of Mr. Paul seems to be that there is no objection whatsoever to installing roller-bearing cars, in either anthracite or bituminous mines, while there are a good number of plain-bearing cars yet in service. I presume that these writers all have referred in their letters to mines where the plain-bearing cars had been in use for some three or four years.

The saving effected, in respect to lubrication, etc., brought out in the several letters, is certainly quite remarkable and very interesting to me. The discussion has opened my eyes with regard to some points about which I was a little hazy before. I must say that looking at it from as practical a viewpoint as is possible, the mine that is operating with plain-bearing cars is simply wasting a great deal of energy that could and should be conserved. Either that or it is failing to produce the tonnage which it would otherwise be possible to produce.

In conclusion, allow me to say that these various letters have opened up a good field for discussion, and I hope that many other members of the mining fraternity will give us the benefit of their experiences.

Brooklyn, N. Y.

J. R. STURGES.

Frozen Mine-Car Journals

Letter No. 1.—The short article that appeared in *Coal Age*, Mar. 30, p. 573, by Henry M. Payne, describing the method of overcoming the difficulty due to the freezing of the journals of freight cars in extremely cold weather, reminds me of my experience last winter when visiting the mines in western Pennsylvania.

At that time, my interests called me several times to the mines in that section, and I was greatly impressed by the serious delay in the operation of the mines, caused by the freezing of the journals of mine cars. At one operation, I counted at least 35 cars overturned at the side of the track, being thrown out of commission because they could not be moved on the track until they could be thawed out.

This trouble would not be so serious if the mines had a surplus of cars, which is not usually the case, however.

At most mines the entire rolling stock is kept constantly in use, except such as are undergoing repairs, and where a few cars are thrown out of service, in the manner I have mentioned, the output of the mine is much reduced, which means a considerable loss of profits. This feature alone would seem to serve as a strong argument for the use of roller bearings on mine cars. If I am correctly informed, it is possible to lubricate a roller bearing with a lighter oil, as Mr. Payne says is the common practice in automobiling in winter when the heavy oil used is discarded for one that will flow more freely.

The advantage derived, in this respect, by the use of roller-bearings on mine cars was first brought to my attention by coal operators whose mines were equipped with such cars. They stated that, in the coldest weather, they had never experienced any difficulty from the freezing of journals and the operation of the mine had not been delayed by this cause for several winters past since the adoption of roller-bearing cars. To my mind that is an important consideration, since there must be no interruption in the movement of coal, from the working face in a mine to the tipple, if coal properties are to return dividends to their owners.

Washington, D. C.

MAVERETTE ASHLEY.

Mutual Capitalizing

Letter No. 2.—The largest joint meeting of employers and employees, in the history of the safety movement in Kansas City, was held Jan. 19, 1918, when 420 owners, managers and workmen in 75 industrial plants sat down together to listen to and discuss matters pertaining to their common interests. I could not help but feel that this was a practical illustration of the idea of the mutualizing of industries referred to and particularly urged with respect to coal companies in this country, in the excellent Foreword, in *Coal Age*, Jan. 5, 1918.

About 18 months previous to this meeting, 20 resident members of the National Safety Council organized a Local Safety Council. The movement received the hearty coöperation of the Kansas City Chamber of Commerce. Monthly meetings were held at noon in the various plants, when methods were discussed for promoting safety work and the prevention of accidents and fires.

THE FOREMEN'S "ROUND TABLE"

Probably the most important feature in this movement was the establishment of a "Foremen's Round Table," to which the superintendents, foreman and members of plant safety committees were invited. At first, the Local Council provided the program, by supplying a speaker and directing the discussion. A little later, however, the foremen assumed control, and the program of each meeting was based on the discussion of matters that seemed of the most importance to them. The interest greatly increased with each meeting, and all the foremen learned much from each other in regard to the practices in the various plants by which greater safety was insured.

While there are 70 plants in this city, an average of 20 of these was represented at each meeting, and, during the year, practically all the plants had been represented at different meetings. It frequently hap-

pened that the managers of some of the plants would come to the meeting, because they could not get away at the noon hour to attend the regular monthly meetings of the Council. This seemed to cause no embarrassment, however, on the part of the men who spoke freely on the subjects under discussion.

The fear of some employers that the Round Table might become a source of unreasonable demands for safety devices and hygienic improvements has proved to be ungrounded. There has never been a complaint heard at these meetings regarding the failure of an employer to provide the necessary safety appliances, although frequent reference has been made to the conditions existing in different plants.

To illustrate: At a discussion relating to toilet facilities, one foreman remarked, "Well, we've been up against this question, but some day we are going to have an entirely new equipment; and, until that time, we are going to keep the old equipment painted white. The men who have the right idea often speak to the other fellows who are careless and urge them in a friendly way to help in keeping things in good condition; so that we're doing fairly well." The men show their desire to coöperate with their employers by the use of the pronoun "we" in their discussions, which tends to give them a feeling of pride that they are part of the plant.

JOINT MEETING OF MANAGERS AND FOREMEN

This narration would not be complete without referring to a big joint meeting of the managers and foremen, which was held after the Round Table had been running about a year. This consisted of a banquet at which it was first thought about two hundred would be present. The interest was so great, however, that more than four hundred tickets were sold, members of the National Safety Council taking anywhere from 10 to 50 tickets to give to their foremen and Safety Committee chairmen.

The Committee on Arrangements had so distributed the men that representatives from different plants were seated at the same table, and the suggestion was made by the president, who presided at the dinner, that "everyone get acquainted with the men at his table," which all proceeded to do at once, shaking each other's hands across the board.

One of the speakers epitomized the situation by saying that "it is up to the foremen to see that plant operations are conducted safely and men kept at work without loss of time to themselves and the plant, through accidents to men or equipment." I have described this movement briefly in the hope that it would lead to similar movements equally successful in other places.

B. S. BROWN.

Kansas City, Mo.

Coal Production and Booze

Letter No. 8—No one can doubt, after reading the many letters that have appeared in *Coal Age* relating to the effect of booze on the production of coal, but that the drink habit among miners gives valuable assistance to the Kaiser and handicaps our Government in its efforts to win the war. Men working in and around the mines see the effect of booze every day.

Some time ago, one of the leading newspapers in the Wyoming Valley (Penn.) advocated the proposition that the court should regulate the hours when saloons could be kept open. The scheme was to compel the saloons to close from 10 p.m. until 8 a.m. every week day. It was hoped, by this means, to keep those miners who are controlled by the drink habit, in a fit state for work in the mine. The plan was favored generally throughout the valley, by mining men, who declared that the efficiency of mine workers would be greatly increased if this action should be taken.

COURTS PETITIONED BY SOCIETIES AND CHURCHES

The courts were further petitioned by patriotic and fraternal societies and church organizations. In the little mining camp of Shickshinny, the Odd Fellows Lodge and the Patriotic Order of Sons of America unanimously adopted resolutions, asking the court of the county to refuse licenses for saloons in that camp, during the continuance of the war.

They urged this for patriotic purposes, stating that the little borough was practically a mining settlement and that, following payday at the mines and after holidays, it is practically impossible to operate the mines at anything like their full capacity, owing to the miners failing to report for work, because of their drunken state. It was stated that the two orders just mentioned represented about 85 per cent. of the men in the camp.

In response to these petitions, the honorable judge stated that he could not withhold licenses from the saloons when no complaints had been made by the operators of the mines. This fact would make it appear that what is needed is that mine operators should link hands with the better class of their men and, with them, petition the courts to close the saloons or regulate them in a manner that will not interfere with the steady and complete operation of the mines.

COAL OPERATORS STRONGLY URGED TO DO THEIR PART TO EXTERMINATE THE SALOON

It goes without saying that coal production, everywhere, suffers from the presence of the saloon in the vicinity of the mine. No mine worker can do efficient work unless he is in fit condition, and this is not possible where his time and money are spent in the saloon, during idle hours.

Allow me to suggest, further, that coal operators would do well to follow up and advocate strongly the suggestion of Fuel Administrator Garfield, who gave warning of the possible revocation of the license of any saloonkeeper or bartender who sold drink to miners previous to their going to work in the morning.

Much can be done, also, in this direction, if mine foremen would impress on their men the fact that the saloon is a poor place for a miner to visit in his idle hours if he expects to hold the good will of his employer. In every mine, there should be the strict prohibition of drinking before and during working hours.

Let me repeat, here, that the Kaiser and booze go hand in hand. If the coal miner is, as the President has said, an important factor in the winning of the war, he must let drink alone and do his bit in support of the fighting men at the front.

Kingston, Penn.

FRED B. HICKS.

INQUIRIES OF GENERAL INTEREST

Air Compressor in a Gassy Mine

In our mine we have recently come face to face with a problem that has caused us some concern, and I want to ask the opinions and advice of *Coal Age* and its readers, in regard to a method that I have had under consideration for some time. I have hesitated putting the plan into operation for fear that the condition of the mine in respect to gas might invite disaster. The situation is becoming urgent, however, and it will soon be necessary to adopt a temporary expedient in order to maintain the output of the mine.

Ours is an old mine that was formerly operated by compressed air exclusively. The growing development of the workings decided us, some time since, in favor of installing electrical equipment, and the result is that we have at present ample electrical power. Not long ago, owing to the inadequacy of our compressed air installation to operate the coal-cutting machines in use at the face, the attempt was made to replace the air machines with electric coal cutters. It was then found that we could only get one machine in three or four months; and, as we require six machines to cut our coal, it became necessary to adopt some expedient that would tide over the difficulty.

The situation is about as follows: The air compressor located on the surface is of sufficient capacity to supply plenty of air to run the six Harrison coal cutters now in operation, if it were not for the extensive piping system that conducts the air from the compressor to the machines. Starting from the plant, there is 1500 ft. of 12-in. pipe followed by the same length of 6-in. pipe. From this point there are three branches, making from 1000 to 2500 ft. of 4-in. pipe leading to different sections of the mine, and 1½-in. pipe is then used a short distance from the working face.

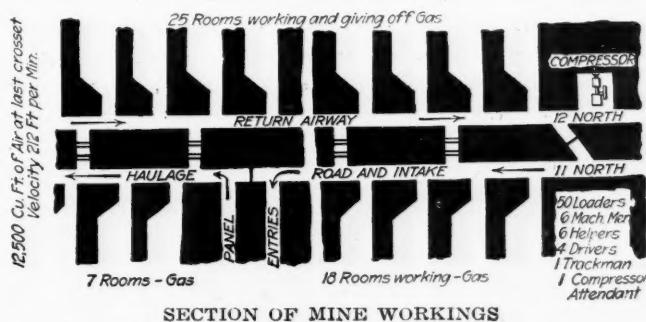
We have taken good care of this piping system, everything possible having been done to stop the leakage of air. After a close examination of the entire pipe line, I have concluded that in order to operate the machines with anything like efficiency, it would be necessary to replace much of the line and to purchase about 3000 ft. of 12-in. pipe. This, however, is plainly out of the question, as we shall soon abandon the air system.

Casting about for some way out of the difficulty, I have found that it is possible to exchange some of our pipe and other equipment for some small air compressors that have been in use in another operation and which can be run by electricity. The idea of making this exchange has interested me greatly, but there are one or two questions that must be settled regarding which I wish advice.

The accompanying figure shows the general arrangement of the workings, there being some fifty rooms working on the 11- and 12-N. The ventilation is sufficient for all present needs; but the fan is now working to the limit of its capacity, and it will not be possible to

further increase the circulation of air. In the figure, I have marked the rooms as generating gas, although this is not the condition at present, but I wish to provide against trouble that may arise later. Today, there is not sufficient gas generated in the rooms to show a cap on a safety lamp, except when the face has advanced 40 or 50 ft. ahead of the air.

In connection with the electrically-driven air compressors mentioned, my plan is to locate these at a convenient point near the working face, which will save the great length of pipe line now required to conduct the air to the machines. By rights, the compressors should be located on the intake airway to avoid the possible ignition of gas in the return air. In the sketch, however, I have shown them on the return airway where



less difficulty would be experienced by reason of having to carry the pipe under the track on the haulage road.

There are close to seventy men working in this territory. The ventilation is sufficient at all times to keep the return air current below the explosive point when working under the present conditions. I would like to ask: (1) With the compressors located on the return airway, and compressing that air charged with some gas, would there be any danger of explosion? (2) With the compressor located on the intake airway, would this interfere with the necessary ventilation of the working faces by reason of using the intake current for the compressors and what effect would this have on the fan?

_____, Ky. INQUIRER.

We cannot recommend the location of an electrically-driven air compressor on the return airway in this mine. While the return air may appear to be below the explosive point in the airway, when this air has been compressed to five or six atmospheres, especially if some dust is present, there is a grave possibility of explosion taking place in the compressor cylinders.

On the other hand, it can be stated that the location of the compressor on the intake airway would not interfere with the ventilation of the working faces, because the air compressed would again be released at the working face, after operating the drills. The effect, if any, on the fan would be to assist the circulation of air. This is a good question for discussion.

EXAMINATION QUESTIONS

Bituminous(Penn.) Mine Foremen's Examination, April 9-12, 1918

(Selected Questions)

Ques.—What observations should a mine foreman make during his visits through the mine and what should his written report of the same include?

Ans.—The mine foreman is responsible for the safety of the men employed underground. He must, therefore, be particularly observant of the condition of the roof and sides and the timbering in all working places and on the haulage roads and airways to detect any danger that may be present because of loose top, broken timbers or other causes. He must observe the manner in which the men are performing their work in mining coal, loading cars, or when otherwise employed.

The foreman must see that there is a plentiful supply of timber of the proper length and kind, in every working place. Where safety lamps are used, he must observe the condition of the lamps and the manner in which they are used. Where miners blast their own coal, the foreman must examine carefully the placing of the shots and note what explosives are on hand and the amount of powder charged in the holes.

The foreman must observe the ventilation of each working place and see that the air current is conducted forward so as to reach the face of the coal in sufficient quantity and with the velocity required to sweep away any gases that might otherwise accumulate. He must also see that all void or abandoned places are properly ventilated or sealed off. He must examine, from time to time, all stoppings, doors and air bridges to see that they are not leaking air and observe the breakthroughs and crosscuts made in rooms and entries to see that they are of sufficient size and made at proper distances apart. Finally, he must see that the mine is being operated, in every respect, in compliance with the mining law and note any violations of the mine rules and regulations.

Ques.—What are the economic and other dangers of creeps and squeezes, and what methods would you adopt to prevent them?

Ans.—From a point of economy, the occurrence of a creep or squeeze in a mine presents the danger of the loss of much coal or the use of a large amount of timber and an increased expense for labor in setting the same, or both. It often happens that there is a large amount of tracking, tools and timber lost when the workings take a sudden squeeze. There may also result considerable surface damage for which the company may be liable. There are, besides, the dangers to life caused by heavy roof falls and the possible emission of large quantities of gas located in the roof strata.

The best method of preventing a squeeze or creep is to leave ample pillars for the support of the roof, and avoid maintaining too large a standing area in the work-

ings. Except in particular cases, all pillars should be drawn back as quickly as the rooms are finished. It is necessary, also, to adopt a method of working that will be adapted to the conditions existing in the seam, having due regard to the depth and character of the overlying strata and the kind of material underlying the coal, the hardness and thickness of the seam and its inclination.

Ques.—Suppose a workman was found in contact with a live electric wire and was rendered unconscious. State what steps you would take to revive him. Also, state your procedure in reviving a person found unconscious from noxious gases.

Ans.—Shut off the current or break the circuit at once, if this is possible. Throw an iron bar or other instrument of iron across the live wire, on the side of the victim toward the power plant, which will help to short-circuit a portion of the current. Without delay, if the ground is dry and likewise the patient's clothing, seize the latter and attempt to drag the person off from the wire. Do not touch the person's skin, and, in no case, stand on wet ground or handle wet clothing. Give one steady pull and avoid rocking the person to and fro, which will increase the shock and burn. It is safe to cut the wire on the side of the victim toward the generator, using a sharp dry ax and standing in dry ground.

After removing the victim from the wire, artificial respiration should be performed at once to restore the person to consciousness. Spirits of ammonia on a handkerchief or sponge passed back and forth near the person's nose will assist to revive him. He should be kept warm and every effort should be made to assist the circulation of blood in the body by rubbing the limbs toward the heart. This should not be done, however, until breathing is commenced.

To revive a person found unconscious from inhaling gas, he should be removed promptly to fresh air and artificial respiration applied. If the patient is conscious and able to swallow, give a half-teaspoonful of aromatic spirits of ammonia in a half-glass of water. In giving artificial respiration, the patient should be laid on his back with a coat rolled to form a light pillow placed under his shoulders. When he shows signs of breathing, the circulation of blood should be assisted by rubbing the limbs toward the heart. In all cases, send for a doctor at once while continuing to administer first aid.

Ques.—The cause of the greatest number of accidents being falls of roof, slate, coal, and sides, what methods would you enforce to reduce the accidents from these causes?

Ans.—Insist on the regular and frequent inspection of the working places and a systematic method of timbering. Enforce strict discipline in regard to the setting of timbers and see that the necessary supplies are on hand in every place. Insist on the spragging of the coal while mining the breast.

COAL AND COKE NEWS

Harrisburg, Penn.

The basic point in the proposition submitted by the coal operators of the anthracite region to the sub-committee of the civic bureau of the Board of Trade of the City of Scranton, for the amicable settlement of the mine cave question, is the appointment of a commission of three to administer a fund for the repair of cave damage, this commission to have absolute control of the fund.

The membership of the commission is to be composed of a man named by the coal companies, another by the trade board and the third to be selected by the first two. They are to be paid a salary large enough so that their entire time will be taken up with the work of administering the fund.

The fund is to be created, it is understood, by a voluntary tax on every ton of coal mined in Scranton and the surrounding towns. Every case of damage done surface property will be referred to the commission and its action in the case will be final as far as the administering of the fund is concerned.

The operators included in their proposition that they will repair all damages to properties of the city that have an assessed valuation of \$5000 or less; the creation of the fund to be approximately \$100,000 to repair damages to properties in areas where abandoned mine workings are located, this fund to be perpetual; the non-repair of damage to property of public service corporations; the repair of all city streets, sewers and conduits.

Birmingham, Ala.

In the mining sections of the Birmingham district the activity is regulated only by the labor available. There is need of men at all mines, and though there is no indication of a labor shortage the lack of ample help is noticeable. Second to the labor problem is the car shortage situation. While production in Alabama shows an increase, producers are raising a general complaint against the transportation facilities which are being offered them. Early relief is deemed essential by the producers to offset a serious shortage of fuel, and an urgent appeal has been addressed to the Federal Fuel Administration in an effort to bring about a change in conditions.

While some complaint has been raised in Alabama on the zone system of shipping, every ruling is being obeyed the local representatives of the Fuel Administration state. The complaint of producers centered upon the closing of a good market west of Memphis for the mines in the western part of Alabama, Carbon Hill, Corona and other places. It has been demonstrated to the Alabama producer, however, that a ready market awaits every ton of coal that can be produced in this state, and he is rapidly adjusting himself to the new state of affairs.

The coke ovens of the Birmingham Trussville Iron Co., of Trussville, have started manufacturing coke on an extensive scale, the coal being furnished from the Labuco mines in the western part of the county. The Central Foundry Co., which has extensive properties in Alabama at Anniston, Bessemer and Holt, including the Central Iron and Coal Co. at Holt, in its financial statement for 1917 shows after interest and taxes had been paid, the company earned \$1,228,441, the business being the best of any year for the company. Its net working capital as of Dec. 31, 1917, was \$1,888,687, or more than twice the present market value of outstanding bonds. In 1917 the company wiped out its floating debt of more than \$500,000. The first mortgage sinking fund 6s. 1931, of the company are selling around 83 $\frac{1}{2}$ to yield about 8 $\frac{1}{2}$ per cent.

Charleston, W. Va.

The increasing shortages in cars furnished the Fairmont field is causing the operators and even the Fuel Administration at Washington serious concern. Recently, of 150 mines reporting to the Cen-

tral Coal Operators Association, 62 of the number were shut down, causing 5629 men to be idle and causing a loss in production of 39,910 tons. On some of the days during the recent week the supply has declined to 437 cars, or about one third of the number of cars needed, it being estimated that it takes about 1500 cars to supply the Fairmont District. Not only has there been a loss of production, but the loss of employment has caused serious hardship among the miners, causing intense dissatisfaction and having a tendency to disorganize the industry in the field affected. The union miners in Taylor County recently protested to the Director General of Railroads against the failure of the Baltimore & Ohio to furnish the region's proportional supply, calling attention to the fact that the region was 6000 cars behind the amount to which it was entitled.

The war program of the Government calls for so many more cars from the Fairmont region than has been supplied that a hurried conference was called and held at Baltimore between Vice President A. W. Thompson of the Baltimore & Ohio; President J. H. Wheelwright of the Consolidation Coal Co., and George T. Watson, general manager of the same company, at which plans were perfected to improve the present conditions prevailing in the Fairmont region. As a result of the conference the restriction of the Fairmont district to 700 cars East per day will be increased to 800. The plans worked out have the approval of the National Fuel Administration.

Coal mines in many sections have been forced to close down because of the inability to secure cars. Mines supplying fuel to railroads have been able to secure a far better supply of cars than mines having coal for purely commercial shipment. This discrimination has had the effect of making it possible for companies supplying railroad fuel to maintain their efficiency by keeping their organization intact while mines supplying commercial coal have found it difficult to keep their employees because they have not been able to keep them working regularly.

Dallas, Tex.

Regulations put into effect by the Federal Fuel Administration, at the request of Wiley Blair, of Dallas, Tex., Federal Fuel Administrator of Texas, are designed to increase the use of Texas lignite for fuel and thus release a large amount of coal for other and more imperative uses. The regulations include fixed maximum prices to be charged by the lignite operators. The fixed prices are as follows: Run-of-mine, \$1.40, per ton; screenings, over 1 in. screened with 15 per cent. of screenings deducted, \$1.50 per ton; lignite screenings, 85c. per ton.

Before recommending fixed prices and regulations for handling lignite as a fuel, Mr. Blair employed Alex Cobden, of Fort Worth, an experienced coal and lignite man, to make a careful survey of the Texas lignite fields and mines in operation. This survey disclosed that the use of lignite for domestic and industrial purposes in Texas is rather limited, and Mr. Cobden assigned the following reasons:

1. Because of lack of knowledge of the most efficient method of combustion of lignite.

2. Difficulty of transporting and storing.

3. Ability of consumers to purchase fuel oil or bituminous coal in Oklahoma and Arkansas at about the relative cost of lignite and the rejection of the latter for the fuel with the higher heating efficiency.

The report of Mr. Cobden shows that the supply of lignite in Texas is enormous. In the United States it is estimated that there are 127,000 square miles of lignite territory, distributed in ten states, and of this total, Texas has 60,000 square miles, or 47 per cent. of the aggregate. Conservative estimates show workable beds in the state containing at least 17,000,000,000 tons.

The Texas Fuel Administrator declared that if lignite is given an even break with other fuels and its sale prosecuted vigorously and intelligently, there is no reason why the annual production should not reach

5,000,000 tons instead of approximately 1,900,000 tons, and the revenue kept within the state amount to \$7,000,000 or more annually instead of about \$1,000,000, the probable revenue from the output of lignite in Texas in 1917.

Comparative figures on cost of lignite and various kinds and grades of coal at various points in the state, which cost includes expense of unloading, firing and removal of ashes, show that Oklahoma and Arkansas screenings are 14 per cent. higher than lignite and fuel oil is 8 per cent. higher than lignite. These comparative costs, the Fuel Administrator says, demonstrate the economy in the use of lignite instead of coal, especially in view of the uncertain deliveries.

For domestic use lignite is not an ideal fuel, yet it is freely used in central and southwest Texas. Lignite can be used, however, in almost any type of furnace, although in some cases it may be necessary to change furnace grates to get better combustion and greater efficiency.

The heat efficiency of Texas lignite with the other steam fuels with which it competes are as follows: Texas lignite, 7500 B.t.u. per pound. Oklahoma and Arkansas screenings, 11,500 B.t.u. per pound. Fuel oil, 19,500 B.t.u. per pound. North Texas natural gas, 700 B.t.u. per cubic foot.

Texas lignite contains 25 to 35 per cent. moisture, which must be evaporated before the lignite will burn readily, and this consumes about 5 per cent. of its heat value.

Lignite operators in Texas now have 15,942 acres of developed lignite lands, and the average thickness of the lignite vein on this developed land is 7 ft. 4 in. It is conservatively estimated that the present operators possess approximately 148,000,000 tons of lignite, or about 8.7 per cent. of the total lignite in the state.

There are now thirty producing lignite mines in Texas, distributed by counties as follows: Bastrop County, 7 mines; Henderson County, 3 mines; Hopkins County, 5 mines; Houston County, 1 mine; Leon County, 2 mines; Medina County, 1 mine; Milam County, 6 mines; Robertson County, 1 mine; Titus County, 2 mines; Wood County, 2 mines.

The estimated total consumption of fuel in Texas during 1917 is as follows: Lignite produced in Texas, 891,116 tons. Bituminous coal produced in Texas, practically all consumed by Texas railroads, 1,197,972 tons. Fuel oil consumed by railroads, 9,100,000 bbl. Fuel oil consumed by industrial plants, 8,000,000 bbl. Natural gas produced in Texas, 13,323,747,000 cubic feet.

The lignite industry opens up a great investment field for Texas money, and companies are now being organized to develop some of the idle lignite lands.

PENNSYLVANIA

Anthracite

Wilkes-Barre—Marcin Urbin, a miner in the Bliss colliery of the Lehigh & Wilkes-Barre Coal Co., has been presented with a medal by officials of the company for having established a new record in individual mining. During the month of March, Urbin, who is 25, mined 350 cars of coal and 58 tons of rock. He worked every day, Good Friday included.

Mount Carmel—Two of the largest verdicts ever awarded by juries in Northumberland County have been sustained by Judge F. B. Moser in opinions filed on Apr. 13. Joseph Ford was awarded \$11,636 against the Reading Coal and Iron Co. for the loss of his leg at the knee. Peter Sebastian, a miner, was awarded \$6425 against the same company for permanent injuries to his spine and hips.

Bituminous

Uniontown—J. G. Carroll, referee in bankruptcy of the J. V. Thompson estate, recently confirmed the \$6,000,000 purchase of the J. V. Thompson coal lands by the H. C. Frick interests. He dismissed all exceptions to the sale and directed that all mortgage creditors involved in the 12,000 acre deal be paid in full with interest. He directed that none of the costs should be borne by the mortgagees. Mr. Carroll directed that \$3,200,000 of the purchase

price should be paid to the Thompson estate. The decision will be forwarded to the District Court of Western Pennsylvania for final confirmation.

Uniontown—Remonstrances have been filed in the Fayette County courts asking that all the liquor licenses be suspended during the war. It was pointed out that the coke operators in the county discovered this year that on account of the intemperance of the miners at Easter their output was diminished from 14 to 21 per cent. Police records of Uniontown, which has a population of 20,000, show that there were 5000 arrests for drunkenness made during the last year. There are now 54 retail licenses, 18 distilleries and 9 brewers in the county. Two of the distilleries are not asking for renewals of their licenses, but there are three new applications for retail licenses at hotels.

Johnstown—A precedent is believed to have been established by Jacob Snyder, compensation referee in a decision rendered in the case of Mrs. Robert MacTavish, of this city, in which he refuses to order the discontinuance of compensation granted for the death of her son, although she has remarried. Mrs. MacTavish lost a son as the result of an accident in a mine of the Pennsylvania Coal and Coke Corporation. Compensation was granted for 300 weeks at the rate of \$2.71 a week. Mrs. MacTavish remarried a short time ago. The fact that the beneficiary remarried does not affect the compensation. Referee Snyder ruled.

WEST VIRGINIA

Edgwood—At a recent meeting the Council unanimously decided to prohibit the Fairmont & West Virginia Coal Co. from putting in a proposed sidetrack at its new operations here. It is not known what steps the company will take. It is claimed that if the mines are established in this district it would greatly decrease the value of surrounding property.

Clarksburg—A tract of Pittsburgh coal on the West Fork River, near here, has been bought by W. F. Bickman from Lauda Custer and others at the price of \$1000 an acre. Several tracts of Pittsburgh coal have lately brought this price in this county.

Weston—A railroad siding will be laid and a tipple built at the farm formerly owned by W. J. Nichols, which has been bought by the Beckley Coal Co.

The Lynch Coal Co., of Berkeley, has recently acquired 7.0 acres of coal lands on the Baltimore & Ohio R. R. between Weston and Gaston, and is planning for the installation of the necessary machinery, including the construction of a grader tipple, for immediate development work.

Elm Grove—Work is to begin at once on the new tipple at the No. 1 mine of the Elm Grove Mining Co. The lumber has been on the ground for some time, and the contractor, P. T. Finnegan, will put a force of men to work on the structure at once.

The Century Coal Co. has already driven an entry into its coal field here and is taking out coal sufficient for its present needs. The large force of workmen required to carry on the work will necessitate the erection of a large number of houses during the coming summer.

Williamson—The Gray Eagle Coal Co. is preparing to tap the No. 2 Gas seam with a slope which it will soon sink.

A new tipple will be built and 3600 ft. of siding laid by the Wigarb Coal Co. as a preliminary step toward operating a mine at Goodman.

A new tipple of the Bailey Coal Co. at its mines on Pond Creek has almost been completed.

Beckley—Fifty-five new houses will be built and three-quarters of a mile of siding laid by the Ingram Branch Coal Co. of which C. H. Mead is general manager.

Clothier—The Boone County Coal Corporation, controlled by Philadelphia capitalists, has acquired the mines of the Coal River Coal and Coke Co., at Dobra, on Coal River.

KENTUCKY

Hazard—Frank Raney, of Raney & Denham, civil engineers, has been named superintendent of the Hazard-Jellico Coal Co., which was formerly operated at the Harvey Coal Co., with mines on First Creek. E. E. Denham has become engineer for the First Creek Coal Co. These coal properties have been taken over by Jouett, Biglow & Brooks, of Detroit, Mich., and have named E. L. Douglas, former manager of the Harvey Coal Co., as general manager of the combined interests.

ILLINOIS

Gillespie—Workmen have installed the tipple scales in the tipple at the Superior Coal Co.'s mine No. 4, a new mine. As soon as the main shaft is completed coal will be hoisted that way. From 300 to 400 tons are being handled now and a much larger production will be made when the tipple is ready for use.

The Coyne Drill Co. has begun testing operations half a mile north of here. If the results are satisfactory a mine will be sunk by a company which is being organized by G. W. Schmidt, S. M. Westwood, W. E. Schmidt and others. A new building addition will be laid out adjacent to the development.

Pana—An explosion in the Shoal Creek mine Apr. 12 wrecked the air shaft and the fan. It is believed to be the work of I. W. W. workers. About ten days ago ten sticks of dynamite were found in the mine, but the fuses had burned out without any damage being done. Since that time many of the miners have refused to work in the mine.

Toluca—The Toluca Coal Co., operated by the Jackson-Walker Coal and Mining Co., is installing improvements to cost \$175,000, including steel tipplers and modern power plants and mining machines. This will increase the tonnage from 1000 to 1800 tons a day. The same company is installing a new power plant at Marceline, introducing mining machines and crushers to crush all production for railroad purposes. The tonnage in southwestern Kansas, Frontenac, has been increased by reason of new mines from 2000 to 4000 tons and a further increase will be attained by fall, from openings of mines and development of present ones.

Farmersville—The ownership of the Farmersville coal mine is being investigated by the Government. When it was sold at receiver's sale several years ago it was bought by bondholders in Germany and is supposed to still belong to them. If this is found to be the fact the mine will be seized by the Government and disposed of. The mine has a 14-ft. vein on excellent quality, but there is no rock above it to act as a roof, which makes mining expensive. It is probable that if a sale takes place an effort will be made to reopen it.

Springfield—County Clerk Byers has been authorized by the Government to issue licenses to miners to buy fuse. Some time ago Government inspectors ordered that no fuses be sold to the miners except at the mines where they were employed. Protest was made against the restriction, on the ground that fuse by itself is not an explosive, and the miners asked to be permitted to buy from merchants, who sometimes sell at a lower price than the employers. Hereafter miners who hold licenses may purchase the fuses wherever they please.

OHIO

St. Clairsville—The Pursglove-Mahen Coal Co. is making plans to open a new mine to tap the coal owned by it between Glencoe and the Chambers schoolhouse south of here.

Cannelton—The Brush Creek Coal Co. of Columbus, recently chartered with a capital of \$25,000, has acquired a coal property near here, on the Toledo & Ohio Central R. R. The operation has been in idleness for several years and steps have been taken to resume operations. E. I. Washburn is president and general manager.

Athens—The Cincinnati Mining Co., chartered some time ago with a capital of \$300,000, has taken over the property of the Luhrig Coal Co., consisting of approximately 2500 acres on the Baltimore & Ohio. The operation of the property will be pushed by another corporation, known as the Luhrig Collieries Co. Officials of the New York Coal Co. are interested in the two companies.

Foreign News

North Sydney, N. S.—Coal areas at Sydney mines have been taken over by the Indian Cove Coal Co., of Boston. T. H. Hartigan of the Nova Scotia Steel & Coal Co., has been selected president and general manager. The areas which adjoin those of the Scotia Co. and are at tidewater, are extensive. The colliery, which is already a going concern, is expected to produce about 300 tons a day.

Fernie, B. C.—The annual report of the Crow's Nest Pass Coal Co., Ltd., showed

net profits for 1917 of \$57,635, as against \$340,501 in 1916. The balance at credit or profit and loss was \$381,013. The coal mined during the year was 504,768 tons, as against 910,839 tons in 1916, and the coke produced 146,533 tons, as compared with 268,939 tons. The decrease in tonnage was due to a five months' strike and labor shortage. During the year the company spent \$125,102 on improvements and developments.

Toronto, Can.—The manufacture of briquets from the lignite coal of Saskatchewan is to be undertaken on a large scale by the Canadian government acting in conjunction with the provincial governments of Saskatchewan and Manitoba. A recommendation to that effect was made by the Advisory Council for Scientific and Industrial Research in pursuance of which a briquetting plant capable of producing 30,000 tons of briquet fuel per year will be erected in Saskatchewan, where there are extensive lignite deposits in the vicinity of a good market for the output. The estimated cost of the plant, including the outlay for operation and administration during a sufficient period to establish a commercial process is \$400,000, of which \$200,000 will be borne by the Canadian government, Saskatchewan and Manitoba contributing \$100,000 each. The plant will be managed by a commission which will shortly be appointed.

Personals

W. E. E. Koepfer, of Philadelphia, Penn., has been elected secretary of the Pocahontas Operators' Association, headquarters to be at Bluefield, W. Va.

N. M. Garland, of New York, district manager for the Ohio Brass Co., of Mansfield, Ohio, has been elected a member of the board of directors of that company.

O. P. Chatfield, formerly of the Big Sandy, Ky., field, has been appointed general superintendent for the Kanawha Central Coal Co., which recently acquired the holdings of the Black Band and Brier Creek companies at Olcott.

William H. Patton has resigned as Exide depot manager for the Electric Storage Battery Co., of Philadelphia, Penn., to accept a position as salesman for the Ironota Engine Co., making his headquarters at Pineville, Ky.

J. R. Smith, of Jasper, Ala., has been appointed associate mine inspector, vice Thomas Roscoe resigned, effective May 1. Mr. Smith will have jurisdiction over the sixth district and will serve during the administration of Governor Henderson.

C. W. Chappelle has resigned his position as district engineer of the Cleveland office of the Electric Storage Battery Co., of Philadelphia, Penn., to take the management of the St. Louis office of the Ironota Engine Co., with headquarters at 314 North Fourth St., St. Louis, Mo.

Robert S. Blake, one of the founders of the Blake Electric Manufacturing Co., of Boston, Mass., and more recently connected with the Condit Electric Manufacturing Co. as Pittsburgh district manager, is now with the Duquesne Electric and Manufacturing Co. in the capacity of Chicago district manager.

E. L. Sparks, lately Industrial Editor of "Engineering News-Record," has been appointed New England representative of the Ball Engine Co., manufacturer of Erie revolving shovels. Mr. Sparks has had considerable experience in construction work having done a great deal of pioneer work for the Southern Pacific in New Mexico.

M. E. Haworth, of Pittsburgh, Penn., has resigned his position as chief draftsman in the engineering department of the United Coal Corporation to accept the position of chief engineer in charge of construction with the Cambria Collieries Co., with headquarters at Bellaire, Ohio. Mr. Haworth will take up his new duties early in May.

Morgan W. Price of Hazleton, Penn., attached to headquarters of the first aid department of the Lehigh Valley Coal Co., has resigned to accept a position with the C. M. Dodson Coal Co., which operates in the coal fields of Pennsylvania, Virginia and Maryland. Mr. Price has been connected with the Lehigh Valley company for more than 10 years and was considered one of the most efficient men in first aid work in the hard coal region. He will be engaged in a similar capacity with the Dodson interests.

Industrial News

New York, N. Y.—The Homestead Valve Manufacturing Co., of Homestead, Penn., has opened a branch office at 1 Franklin St., New York City.

Louisville, Ky.—The firm of Volkman & Kerlin, one of the older retailing concerns of Louisville, has been dissolved, M. D. Volkman having withdrawn from the concern, which in the future will be conducted by C. M. Kerlin, who has been the junior partner.

New York, N. Y.—The Hyatt Roller Bearing Co. announces that it has opened completely equipped engineering and sales offices in the Metropolitan Tower. All information on Hyatt bearings can be obtained quickly and correctly from these offices, and the concern advises that all communications be sent to the new address.

Columbus, Ohio.—The announcement came out of Washington last week of the resignation of Homer H. Johnson, of Cle eland, who has been Ohio Fuel Administrator for about six months. No reason was given for the resignation and no successor was announced. No information could be secured from the Ohio Fuel Administration office.

Madisonville, Ky.—The O. & R. Coal Co., which recently took over the "No Clinker" mine at Grapevine, has incorporated with a capital of \$20,000 and a debt limit of \$100,000, to handle coal, oil and gas development projects. The company plans installation of a tramway at its mine. James D. Overall, J. B. Ramsey, and others are named as incorporators.

Pittsburgh, Penn.—The Hyatt Roller Bearing Co., has established an office here at 1272 Frick Annex. W. J. Kearns and S. G. Little are the engineers in charge, and it is expected that the location of the office in this city will enable the Hyatt Company to give better service to the mine operators in western Pennsylvania, northern West Virginia, Maryland and Ohio.

Columbus, Ohio.—The Colonial Coal and Coke Co., which is a large operator and retailer in the Buckeye capital, will soon open a new retail yard to be located on Cleveland Ave., near the Norfolk & Western tracks. A site has been purchased and the work of building the plant will start at once. It is expected to have the yard ready for operation by May 1.

Louisville, Ky.—Charles Powell, of Louisville, who recently organized the Powell Coal Co., of Whitesburg, Ky., plans development of several thousand acres of coal land now under lease. An electrically equipped plant and mining town will be installed at a cost of about \$500,000. Plans are being laid for starting the work at an early date. Mr. Powell will be general manager.

Cincinnati, Ohio.—President R. A. Colter, of the Coal Exchange of the Chamber of Commerce, has named a coal quotation committee which will have charge of securing and recording prices of coal for the official records of the chamber, with the following members: Thomas H. Richardson, chairman; W. T. Ulland, M. E. Lynn, William E. Minor, A. A. Liggett, F. B. Raines, James A. Reilly and R. S. Magee.

Charleston, W. Va.—A call has been issued by J. C. McKinley, president of the Richland Coal Co., and other coal operators in the state, to West Virginia mining men to meet in Washington on Apr. 23 for the formation of the West Virginia Mining Association, which is to be known as the West Virginia branch of the American Mining Congress of Washington, D. C. The meeting is set for 11 a. m. at the Munsey Building, Washington.

Lexington, Ky.—The Marion Coal Co., recently organized to develop the Branson coal lands at Indian Bottom, consisting of about 1000 acres of coal property, has purchased most of the machinery for an electrically operated plant of 1000 tons daily capacity. The officers of the company are John P. Gorman, president; George P. Morrison, vice president and treasurer; Robert Curry, secretary, and Harry R. Smith, manager. Offices are in the City Nat'l Bank Building, Lexington.

Centertown, Ky.—The Centertown Coal Co., incorporated last October with a capital of \$160,000, plans development of 1,700 acres of land, and intends to have a daily capacity of 3000 tons of coal. Machinery contracts have been let. The promoters are P. O. McKinney, who is president and manager; W. Pratt Dale, vice-president;

and Brent Altsheler, secretary-treasurer. The latter two men are of Louisville. The same interests are also interested in a new lumber mill at the same point.

Hazard, Ky.—The engineering firm of Raney & Denham has practically gone out of existence. Frank Raney has become superintendent of the Hazard-Jellico Coal Co., while E. E. Denham becomes engineer for the First Creek Coal Co. These properties were recently taken over by Jouett, Bigelow & Brooks, of Detroit, Mich. E. L. Douglas, formerly manager of the Harvey Coal Co., now the Hazard-Jellico Coal Co., has been named general manager of the Detroit company's interests in this section.

Springfield, Ill.—Notice of an embargo on "gas coal," to go into effect Apr. 15, has been received by A. D. Mackie, general manager of the Springfield Gas and Electric Co. The embargo is under the zoning order restricting that coal, which is mined in Pennsylvania, to use in that section. Illinois coal can be used for the manufacture of gas, but it is inferior to the Pennsylvania coal. The company has a supply on hand sufficient for 30 days. After that Illinois coal will probably have to be used.

Springfield, Ill.—The Illinois Central Railroad Co. is conducting a school of instruction at various shops and terminals on fuel conservation. Two cars are sent out to various division and terminal points, and lectures and demonstrations are given in coal saving. The cars are fitted with seats and the talks are given in the cars. It is the plan of the railroad company to acquaint its employees as fully as possible with the fuel problems of the purchasing department and of the best methods of coal conservation.

St. Louis, Mo.—The St. Louis Coal Club, at its annual meeting Monday night, Apr. 8, at the American Annex, elected H. B. Wessel, sales manager of the Kolb Coal Co., president for the ensuing year. The other officers elected were L. P. Coan, first vice president; C. M. Snow, second vice president; E. L. May, secretary; H. C. Richner, treasurer, and E. G. Ridgway, W. H. Riester and H. F. McDonald, directors. Wallace Crossley, Missouri Fuel Administrator, was guest of honor at the dinner and entertainment which preceded the election.

Boyerstown, Ohio.—The Mining Safety Device Co., manufacturer of automatic safety mine car cagers, is introducing this equipment into many mines. Among those operations which have recently installed this company's cagers are the following: Rachel mine at Downs, W. Va.; New River Collieries Co. at Gun, W. Va.; Colorado Fuel and Iron Co. at Walsenburg, Colo.; Fernwood Mining Co. at Mine No. 2, Montana, Ark.; Southern Anthracite Coal Mining Co. at Russellville, Ark.; Pantha Creek mine at Auburn, Ill.; Byproduct Coke Corporation at its Nos. 18 and 19 mines in Franklin County, Illinois.

Columbus, Ohio.—Chieftain Coal Co., of Columbus, incorporated for \$30,000, has been organized by electing W. E. Wheeler, president; John W. Mason, vice president; F. F. Wilkinson, secretary, and Charles C. Green, manager. The company has purchased two operating mines, one located in Vinton County and the other in Noble County. The Vinton mine consists of 221 acres in No. 6 seam near Hope Station. The other property was purchased from the Central Ohio Coal Co., and consists of 77 acres located on the Ohio River & Western R.R. The product will be sold through the Wheeler & Mason Coal Co., Columbus.

Columbus, Ohio.—A story is current of how the state of Ohio lost a half-million dollars which it might have realized on a coal deal. Last fall when the State Board of Administration was considering the policy of mining coal for the various institutions under its charge, it was given an option on a tract of Hocking Valley coal lands near Athens, at a price of \$175,000. The option was allowed to expire. Some time ago, when it was decided by the board to again take up the project, attempt was made to get another option on the same property, when it was discovered that the holding had been sold to a New York syndicate for the sum of \$775,000 cash.

Columbus, Ohio.—Ohio wagon mines have been struck a hard blow by a recent ruling of the Federal Fuel Administration in ordering that no open-top cars be apportioned to such mines, where they are unable to secure box cars. Owners of wagon mines claim that they are unable to get sufficient box cars to take care of their output and that the ruling, if permitted to stand, will put hundreds of them out of business. The owners point out that it was the wagon mines of the state last

winter that saved the situation and that they will be in the same position to help next winter, if there is an acute fuel shortage, if allowed to operate and ship their product. The ruling is an annulment of a former ruling permitting the use of open top cars by wagon mine owners.

Columbus, Ohio.—One-fourth of the coal consumed by rural Ohio can be substituted by wood next winter, states Edmund Secrest, forestry expert at the Ohio experimental station. He estimates that the population on farms and in villages less than 2500 is 2,101,978, and that it consumes 1,890,000 tons of coal annually. By the use of available wood 12,000 carloads of coal would be diverted to war industries and that number of cars released on the already overburdened railways. This substitution would require 700,000 cords of wood, which it is claimed is now going to waste. Its value in stumpage and labor is estimated at \$5,970,000. A campaign will be started urging wood as fuel for rural homes, churches and assembly halls.

Belleville, Ill.—The St. Clair Central Railway Co. has been incorporated by J. T. Taylor, W. C. Wolf and P. K. Johnson, of Belleville, and Louis E. Fischer and John Henderson, of St. Louis, to lease the properties of the Southern Illinois Traction Co. and extend the line, which has been constructed from East St. Louis to Belleville, through St. Clair, Washington, Perry and Franklin Counties to Benton, to be used principally for the transportation of coal. The Southern Traction Co. is now in the hands of a receiver and its affairs are being wound up in the United States District Court. The new company expects to operate the road in a short time as far as Belleville for the transportation of coal from three mines adjacent to it, and extend it to Benton as soon as possible.

St. Louis, Mo.—The St. Louis Fuel Committee, with the approval of Wallace Crossley, Missouri Fuel Administrator, announced Apr. 13 the summer scale of prices for St. Louis. On orders placed in April for April and May delivery the price is to be the same as at present. On orders placed in May for May delivery the price will be advanced 15c. a ton. On orders for delivery in June or thereafter the price will be 30c. higher than at present. The total advance of 30c. a ton is 21c. a ton less than was asked by the Coal Service Bureau, which introduced evidence to show that distribution cost had advanced 51c. a ton since last year. Administrator Crossley has issued a statement warning nonessential industries that if they fail to lay in early their next winter's supply of coal they will get scant attention when the supply is below the requirements of essential industries and domestic consumers.

St. Louis, Mo.—The Terminal Railroad Association filed with the Interstate Commerce Commission at Washington, Thursday, Apr. 11, its answer to the petition of the Chamber of Commerce for the removal of the bridge arbitrary of 20c. a ton on coal. The answer denies that St. Louis and East St. Louis are one industrial zone and that the charge is a discrimination against St. Louis. The charge of 20c. a ton, it is claimed, is not only for hauling coal across the bridges but for all terminal services. It is declared that there is a difference between St. Louis and Chicago, Minneapolis, St. Paul and other cities mentioned in the Chamber of Commerce petition, in the circumstances under which coal is delivered. It is claimed that transportation conditions since the present rate was granted by the Commission would justify increasing the rates instead of lowering them. A hearing on the petition will be held at the Jefferson Hotel on May 2.

Philadelphia, Penn.—At a meeting of the Philadelphia Wholesale Coal Trade Association, held on Tuesday, Mar. 26, 1918, at the Manufacturers' Club, it was decided to appoint a committee to express appreciation of the services rendered the association by its president, Noah H. Swayne 2d, while acting as commissioner at Washington of the National Coal Jobbers Association. The following resolutions were engrossed, suitably framed, and sent to Mr. Swayne at Washington: RESOLVED: That the members of this association owe a lasting debt of gratitude to Mr. Swayne for his untiring efforts in behalf of the coal trade during the past several months and for the very valuable assistance to the United States Government by his suggestions and recommendations to the United States Fuel Administrator. Be it further resolved that we express the unanimous assent of the entire membership when we say that Noah H. Swayne 2d has nobly and loyally done his whole duty and that we fully appreciate him and wish him every success.

MARKET DEPARTMENT

Weekly Review

Many Orders from Consumers—Dealers Unable To Get Coal To Satisfy Demand—Bituminous Coal Situation Getting Worse—Stimulus Needed for Greater Production

COAL-DISTRIBUTION plans go on apace; modifications are being made to the zoning system to facilitate the shipping of coal; the Fuel Administration is rapidly winding up most of its immediate problems—but the coal itself is lacking.

Repeated urgings that consumers lay in their next winter's supply of coal during the coming summer months have resulted in a flood of orders from domestic users, but the trade is at a loss to know how the demands are to be satisfied.

Supplies of the domestic sizes of anthracite coal are short, and the efforts made by a number of dealers to stock up proved unavailing. And this in spite of the fact that March was heralded as the banner month in the his-

tory of the anthracite industry. The situation is serious. Great improvement must be shown in the near future if the plans to have a large tonnage stocked this summer are to be carried out. Steam coal business continues to be active. Buying on the part of steam plants is good, and a marked disposition is shown by many factories to accumulate a surplus. Every available ton of steam coal is quickly taken up.

The bituminous coal situation is getting worse. So far as production is concerned the past month has proved to be as barren of favorable results as any month in 1917. The basic cause for the meager output is the poor car supply furnished by the railroads. Another obstacle is the unsettled question of the price to be paid for railroad

coal. Despite the pressure being brought to bear upon the director general of railroads to renounce the fuel policy promulgated by John Skelton Williams, no tangible results are yet in evidence.

Owing to the lack of cars many of the large producing mines can work only half time. This is having a demoralizing effect on mine labor. In West Virginia the mine workers are deserting the mines for the large steel mills and munitions plants, as these industries hold out the promise of high wages and regular employment.

The settling of the railroad fuel matter and the introduction of an equitable plan for the distribution of empty cars to the mines will go far toward providing the much-needed stimulus for greater coal production.

COAL PRODUCTION

A decrease of 1,500,000 tons, or 14 per cent. as compared with the preceding week, marked the total output of bituminous coal during the week ended Apr. 6. The total production of bituminous coal (including lignite and coal made into coke) is estimated at 9,395,000 net tons. It is difficult to determine the rate of production per working day because of the unequal observance of Mitchell Day, Apr. 1 (anniversary of enactment of eight-hour law), as a holiday. Next week when the reports from individual operators will be available it will be possible to make allowance for the effect of the holiday in reducing working time. Comparison of the production of Monday, Apr. 1 of 16 roads reporting 10 per cent. of loading, with the average of the two Mondays previous thereto and Monday, the 8th instant, indicate that Mitchell

the car situation. In Iowa the decrease of 3 per cent. in production was due to losses on account of no market which rose from 20.5 per cent. of the week previous to 24.9 per cent. Oklahoma and Arkansas, however, report no market losses at 18.6 per cent.; 6.3 per cent. lower than last week.

Beehive Coke—Sixty-six operators in the Connellsburg, Greensburg and Latrobe districts of Pennsylvania report improvement in operating conditions during the week ended Apr. 6. These operators produced 306,320 net tons, or 67.2 per cent. of their full-time capacity as against 63.7 per cent. for the week previous. Losses due to car shortage declined from 24.3 per cent. for the week of Mar. 30 to 12.8 per cent., but labor shortage increased nearly 8 per cent. The week's performance, however, was the best since the early part of December. The same operators shipped 156,109 net tons of coal.

Byproduct Coke—The output of byproduct coke during the week of Apr. 6 was slightly below the production of the previous week, and the decrease is attributed mainly to labor shortage in Pennsylvania. The ratio of tonnage produced to actual capacity declined from 88.6 per cent. the week of Mar. 30 to 87.5 per cent. No material changes were reported by any of the states with the exception of Pennsylvania, where production amounted to 79.9 per cent. of full-time capacity compared with 83.8 per cent. for last week. The loss in this district is attributed to labor shortage, reported at 5.3 per cent. of full-time capacity, while no loss due to labor trouble was reported during the previous week. The lowest ratio of production to capacity was reported by Indiana at 78.1 per cent. of full-time capacity.

CARLOADS OF COAL AND COKE ORIGINATING ON PRINCIPAL COAL-CARRYING ROADS

Week Ended:

Mar. 16 Mar. 23 Mar. 30 Apr. 6

Bituminous shipments, 123 roads	190,298	191,127	189,546*	161,500†
Anthracite shipments, 9 roads	42,265	42,487	43,642*	32,232†
Beehive coke shipments, 4 roads	.....	13,218	13,643	13,320* 12,801†

* Revised from last report. † Subject to revision.

Anthracite shipments decreased from 43,642 cars for the week of Mar. 30 to 32,232 cars.

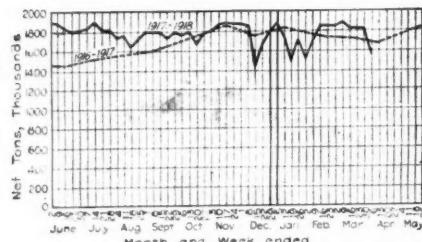
BUSINESS OPINIONS

Bradstreet's—War needs naturally grow at a great rate, and industrial operations in lines essential to them continue to expand. Cereal crop news is exceptionally favorable, whatever may be conjectured as to storm effects on northern fruits and southern truck. Wholesale trade in staple commodities is probably as active as could be expected, seeing that supplies are short, that quotations are inordinately high, and that the Government gives some indication of eventually extending a firm grasp over the price situation in many lines of manufacture.

American Wool and Cotton Reporter—The woolen goods situation has been much upset by what amounts to the commandeering of available machinery for fabrics required by the Government. Little change is expected in the woolen goods market for some time to come. Production will be largely upon special fabrics and there will be little available production for ordinary distribution. During the week under review the only change in the cotton goods market has been the comparatively small trading. Altogether the cotton goods market may be characterized as a runaway market. Prices appear to be at or very near the top. The demand for goods is much smaller than it actually appears to be and existing conditions create high prices.

Marshall Field & Co.—Current wholesale distribution of dry goods is ahead of the heavy shipments for the same period a year ago. The total volume of road sales for both immediate and future deliveries shows a good increase over the large volume of the corresponding week of 1917. Merchants have been in the market in fewer numbers. The market on domestic cotton goods is strong. Collections continue good.

The Iron Age—This week most plate mills are running 100 per cent. on Government and Ally work, save such part of their product as in ordinary practice cannot meet ship requirements. Great Britain is getting 5000 tons of plates a week to apply on the 300,000 tons her yards are to have in return for British advances of munitions and other steel to the American army in France. The War Industries Board is urging the Railroad Administration to take Bessemer steel rails instead of open hearth as far as possible for this year's renewals, so that all the open-hearth steel needed may be available for shells and other war requirements.



Day was equivalent to 0.4 of a regular working day.

The total production of beehive coke is estimated at 624,000 net tons, about 4 per cent. decrease. The average per working day is estimated at 104,000 compared with 108,000 for the week previous.

Decline in production is reported by the western Pennsylvania fields 73.7 per cent. for the week of Mar. 23, to 61.6 per cent. for Mar. 30; Somerset County, Pennsylvania, from 49.6 to 36.9 per cent.; high volatile fields of south West Virginia from 59.5 to 49 per cent. and northeastern Kentucky from 63.1 to 47.9 per cent. Losses in production by these districts are mainly attributed to lack of coal cars. Losses on account of no market in the Kansas and Missouri fields rose from 19.2 per cent. for the week ended Mar. 30 to 26.8 per cent., although production in these districts decreased but slightly due to improvement in

Somewhat lighter rail sections are also suggested so as to conserve steel.

Dry Goods Economist—The sudden stoppage of trading in wool in the Boston, Philadelphia and New York markets and the prospect that the production of wool fabrics of all grades for commercial purposes will be halted until August, or later, have formed the principal topics of discussion in dry goods circles this week. To what extent cotton dress goods can take the place of woolen and worsted fabrics is likely to be demonstrated next winter if the supply of raw cotton proves equal to the demand. Prices of cotton goods will probably be stiffened as a consequence of the increased call now looked for. Spot cotton was quoted on Wednesday at 35c. per lb., a decline of 1c. from the high price reached last week.

Atlantic Seaboard

BOSTON

Some progress on "contracts," and shippers show more confidence in receipts by water. Still a large number of plants not "covered." Unsettled question of railroad fuel one of the obstacles. New England all-rail factors decide to oppose assigned cars for engine supply. Order that bunker coal be confined to high-grade low volatiles another cause of realignment, together with Government 65 per cent. ruling. Meanwhile production lags. Hampton Roads piers short of coal. New England Fuel Administration gives attention to zoning of consuming territory. All-rail embargoes lifted on Apr. 11. Anthracite deliveries still disappointing.

Bituminous—The rehandling factors at Boston and Providence having opened the way by "covering" the consumers who regularly look to them for supply, several of the all-rail shippers have arranged "purchasing contracts" which are assumed to guarantee to the buyer their best efforts to secure coal. The all-rail shippers, however, have lately stated their inability to get assurances from operators beyond 50 to 60 per cent. of the tonnage they were able to engage last year, and it is obvious that a large number of New England plants are leaving no stone unturned in their attempt to get their supply lined up. A large volume of anthracite steam sizes down to silt and culm has been placed, and everyone knows this would not have been done if good steam coal was thought in prospect in sufficient quantity. In spite of spasmodic outcry against using car service on stuff that runs 30 per cent. ash, the outlook is for a big increase in its tonnage this year.

Distributors of water coal inland who were guarded in making commitments six weeks ago have now closed with their 1917 customers for 100 per cent. some rehandlers making a price subject to increases in Government prices, freights, etc., and others making no price but on a cost-plus basis. In this way a large tonnage has been covered. There seems to be a new optimism among the Hampton Roads shippers over the New England prospect, due apparently to the assurance that a large number of boats, including steamers from off the lakes, will be placed in the coastwise service. Some dependence also is being put upon the extra volume of Pocahontas and New River that is expected to flow east under the zoning plan. Certainly ideas of price have been modified the past week on spot coal f.o.b. Boston and Providence. Pressure brought to bear by the New England fuel administration has tended to bring prices down to a cost-plus basis, and from now out there is likely to be less complaint along this line.

Production is sagging off while important questions remain unsettled. A mine operator who tries to do the fair thing by the Government and by his accustomed trade sees his men leave and he is rapidly being deprived of an organization it has taken years to build up. It will require most skillful handling on the part of the fuel authorities to avoid a far worse situation this fall than obtained at any time the past winter. The reservation that operators shall not contract for more than 65 per cent. of output is another serious influence on production.

The shortage of coal at Hampton Roads is another sign of the times. We are constantly being assured that more boats will be forthcoming, but shippers are not likely to take on boats unless there is reasonable assurance that the coal will be brought to tidewater. It has been officially affirmed that New England needs this year 20,000,000 tons by water. This means nearly 1,700,000 tons monthly, against which the average for January, February and March was 667,000! Certainly there will have to be some speeding up before long.

The New England fuel administration is beginning seriously to take up the question of zoning New England territory as between shipments all-rail and those by water. It is felt that a considerable gain can be made by restricting points within a short distance of Tidewater to water shipment, and should rail movement be relieved to that extent the congestion that was usual last winter will be obviated. It follows that any such action must be arbitrary, for the inequality in price is such that it will be impossible to make a regulation without drawing a hard-and-fast line. Wherever the line is drawn there is bound to be a lot of adverse criticism, but the feeling is so strong that next winter it is going to be a question of getting coal and not so much a question of price that the trade as a whole will back any reasonable arrangement. There is a feeling, for instance, that Maine should be entirely excluded from all-rail deliveries, and with this question up the conference which Mr. Storrow has called for the 22d will be an interesting occasion. All embargoes against coal into New England were lifted by the 11th instant.

Anthracite—All-rail deliveries show improvement over last week. Apr. 15 was the biggest day on anthracite through the New England gateways since Mar. 14, 803 cars being passed through. This, of course, includes junior sizes and culm, but is nevertheless a satisfactory showing, considering the congestion that has been the rule and the number of embargoes that were in effect ten days ago. The Boston & Albany and Boston & Maine show a movement about normal, and although the New Haven is still in poor shape as to deliveries via Maybrook and Harlem River there is really a considerable improvement even at those points. Not so much can be said for receipts by water. On barge shipments from New York and Philadelphia the tonnage is uniformly disappointing.

NEW YORK

Lack of coal a serious matter for New York. Record-breaking shipments apparently of little benefit to this market. Complaints are numerous and everybody demanding coal. Prospects for next winter not promising. Commercial bituminous scarce. Operators complain of car supply and defection of employees. Railroads continue efforts to buy coal at low prices.

Anthracite—The last half of April finds the situation extremely serious. Supplies are short and efforts of the dealers to stock up result in nothing. The trade was interested in the statement of the Anthracite Bureau of Information that March was the banner month in the history of the anthracite industry, only to inquire where the coal shipped to market was sent.

Market conditions show no change for the better, but on the contrary are apparently growing worse. Taking the advice of the Fuel Administration the public have placed their orders for winter supplies but are unable to get the coal. Retail dealers are likewise unable to buy coal, and the wholesale offices are crowded at all times with dealers willing to take any of the domestic sizes obtainable.

There is not much hope held out for any improvement in the situation this month. Reports show that shipments for the first week of April were about 11,000 cars less than they were the last week of March and about 7000 cars less than the first week of the same month.

Dealers are apprehensive of the plan of distributing coal on the 1916-17 basis. Demand has steadily increased and dealers are fearful that if the plan is strictly adhered to there will not be coal enough to go around. Meanwhile the wholesale dealers are making every effort possible to induce heavier shipments to this market.

Stocks of the domestic sizes are low with no immediate betterment in sight. The steam sizes are in better shape and now, on account of the higher temperatures and the consequent let-up in consumption, stocks are larger and in some instances quotations are lower.

Current quotations, per gross ton, f.o.b. Tidewater, at the lower ports are as follows:

	Circular	Individual
Broken	\$6.15	\$6.90
Egg	6.05	6.80
Stove	6.30	7.05
Chestnut	6.40	7.15
Pea	4.90	5.65
Buck	4.45@5.15	4.80@5.50
Rice	3.90@4.10	4.80@4.50
Barley	3.40@3.65	3.00@4.00
Boiler	3.65@3.90	

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous—There has been no change in the attitude of the trade toward the railroads in their efforts to secure fuel below the fixed Government price. Car supply is unsatisfactory and numerous complaints are heard from the miners because of the lack of work. Stocks of commercial coal are low at the docks but bunker fuel is in better condition. Generally speaking, the past month has been about as bad for the trade as any within the past year so far as supplies are concerned, but the demand has not been so urgent because of the higher temperatures.

Operators are not taking kindly to the efforts made to secure railroad fuel at lower prices than those fixed by the President, although they realize that failure to do so will probably mean that their mines will go without anything like a normal car supply, while those mines whose owners give in to the railroad companies will be provided with sufficient cars to permit them working nearly full time. Efforts are being made to have the Fuel Administration supported in its efforts to make the railroads pay the full Government price and also to provide an equal distribution of cars. The extraordinary efforts of the railroads to secure fuel has resulted, according to report, in at least one company having so much coal on hand that it was found necessary for it to dispose of some of the coal to individuals.

Some contracts have been closed with individuals at the full Government price, the dealer acting as purchasing agent.

Labor conditions at the mines are reported as serious. Many of the mines are working less than half time because of the poor car supply which, along the Pennsylvania, is less than 25 per cent., with no better reports coming from along the Baltimore & Ohio. Along the Western Maryland complaints are numerous and operators in addition are threatened with labor troubles.

Many complaints are heard regarding shipments. Some cars already on the road a full month have not been heard from at their destination. Some relief may be expected from an order expected to be issued the latter part of this week modifying the zone system of coal distribution as it affects Baltimore and Washington, and which change it is expected will insure increased shipments to this market and New England. There are reports to the effect that some shippers are shading the Government price on bunker and coal for export.

BITUMINOUS PRICES

F. o. b. New York	Mine Gross	Mine Net	Gross
Central Pennsylvania....	\$5.06	\$3.05	\$3.41
Maryland:			
Mine-run.....	4.84	2.85	3.19
Prepared.....	5.06	3.05	3.41
Screenings.....	4.50	2.55	2.85

PHILADELPHIA

Anthracite—Trade stirred by return of winter storms. Receipts light. Heavy retail orders. Retail labor shortage. Big task ahead of fuel officials. Complaints of distribution plan. Bituminous shortage serious. Lack of cars still the cause. Miners suffer. Railroads try to contract. New bunker regulations. Priority list revised.

Anthracite—Unusual weather conditions, including severe rain, hail and snow storms, caused the dealers to forget all about filling cellars for next fall and winter and devote their attention to small orders of a ton or two for immediate use. The call for chestnut and pea was heavy and the short supply of many dealers was soon exhausted. If it had not been for the liberal shipments here during the latter part of March many yards would have been entirely out of supplies. April shipments to date have been light and the excuse has been that the distribution orders of the Fuel Administration were not clearly understood. No shipments were made by one large company until Apr. 10. However, there are hopes now that this market will be regularly taken care of, and this week some heavy consignments have been made to Port Richmond piers. Altogether the market has been in an unfavorable condition. Little progress has been made in retail deliveries and orders are piling up in the retail offices.

With the opening of spring the dealers are alarmed at the labor outlook, as help is growing scarcer and more independent each week. During the recent stormy weather every yard was shorthanded. Owing to the inferior preparation of much of the coal that came to market last win-

ter there are undoubtedly many dissatisfied customers who are now seeking new affiliations, yet are receiving little consideration from the more conservative dealers. There are others, however, who are taking every order that offers, inasmuch as they are covered as to price at time of delivery, and if orders cannot be delivered they lose nothing.

The fact that the operators are not allowed to make contracts with manufacturers for pea coal is giving the retailers considerable satisfaction, and they are expecting to receive greatly increased shipments of this size during the present coal year. They might, though, feel discouraged if they could learn of the almost unbelievable tonnages of buckwheat and the smaller steam sizes for which the operators are being called upon to reserve for steel and other preferential plants.

The present ruling of the local fuel administration forbidding more than two-thirds of an order calling for more than six tons, to be delivered until all the dealers' customers have received that proportion, is working a hardship on the retail men. They claim that many customers will withhold payment of their bills until their orders are completed and will use this as an excuse to hurry them.

While the independent's charge of 75c. above the companies' price is being accepted as a matter of fact, we find some in the trade who consider the arrangement only temporary and who look for an entire rearrangement of rates, both company and individual. This view is supported by the report from Washington this week in which the National Fuel Administration was reported to have said that a new coal price list and order of distribution had been prepared, but would not for the present be made public.

The steam coal market continues to display much activity, with all production quickly taken up. If there is any lagging at all it is with culm, but even this size has shown some added strength recently owing to the continued stringency in the soft coal market.

The prices per gross ton f.o.b. cars for line shipment and f.o.b. Port Richmond for tide are as follows:

	Line	Tide		Line	Tide
Broken.....	\$4.90	\$6.05	Buckwheat.....	\$3.15	\$3.75
Egg.....	4.50	5.70	Rice.....	2.65	3.65
Stove.....	4.75	6.05	Boiler.....	2.45	3.55
Nut.....	4.85	6.10	Barley.....	2.15	2.40
Pea.....	3.45	4.35			

Bituminous—Meager supplies have been received recently and all industrial plants are running on close margins. Only one cause continues to be assigned for the shortage—no cars. Despite all the efforts that have been put forth by the mining interests they so far have been unable to get any tangible results from the railroads.

Ordinarily at this time of the year the industrial and utility plants hereabouts endeavor to accumulate coal, but now are really fortunate when they have more than a week's supply ahead of them.

The only thing of interest in the contract situation is the fact that the railroads have been endeavoring recently to place their year's business under the usual plan. However, with a fixed Government price they have been unable to do so and now face a heavy increase in fuel costs. It is rumored that the Railroad Administration is working on a plan to allow the companies to buy fuel from the usual sources at cost plus 10 per cent.

Shippers interested in bunker coal this week receive special instructions specifying the grades of coal which must be used in this business. The coals are classified as to their smokeless qualities, which are fixed at four grades for this part, being turned into pools of the local exchange numbered 1, 9, 10, 14 and 22.

BALTIMORE

Order cutting off Pennsylvania R.R. shipments to Baltimore district disturbs trade. Coal supplies low. Hard coal men plan for future.

Bituminous—The entire coal trade, and many consuming interests here, have been plunged into a further state of uncertainty by an order of the Fuel Administration which embargoes coal to this city and vicinity from originating points on the Pennsylvania, Monongahela and Huntington and Broad Top Mountain railroad connections, and all short line rail connections in Maryland, West Virginia and Pennsylvania. Under the zone system it is planned for the Baltimore & Ohio and Western Maryland railroads to make up the deficiency

thus caused. As there is no intimation of the last two railroads being embargoed elsewhere, and both are now failing to meet even their existing obligations here, much uneasiness is caused in trade circles generally over the possibilities of the order. Consumers on the Pennsylvania lines in this section must rely on coal originating on the other roads and transshipped. Among those uneasy over the order are some coal men here who had relied on Pennsylvania R.R. mine connections to fill their business requirements. Jobbers who failed to protect themselves on the other roads must now hustle for new mine supplies and with little prospect of success. Even the jobbers who have Baltimore & Ohio and Western Maryland supply connections, many existing over years, are unable to promise customers what they will deliver, as the mines in most cases are refusing to promise supplies.

The bituminous supply situation here is most unsatisfactory. The only class of coal reaching here in anything like adequate amount is bunker fuel. This has a price difference of \$1.35 for the operators and the difference is undoubtedly a big spur. Many industries here are already short of coal, and one of the important plants the past week was shut off for a time from power because the supply concern could not get coal. Conditions are far from promising, and the local fuel administrator can give no assurance of relief. The long line of red tape needed now to get preferential shipments for emergency needs has further crippled deliveries here apparently.

Anthracite—The hard coal men here are facing the fact that deliveries of anthracite here continue approximately light, and are largely planning for the future. A heavy business is going on the books. Some of the firms are making customers send checks for orders with their Federal applications, and then designating delivery periods, subject of course to the supply received by the dealer. The trade believes that consumers here will be lucky to have two-thirds of their needs in their bins when the next winter rolls in.

Lake Markets

PITTSBURGH

Late opening of navigation. Zoning system getting into operation. Practically sufficient byproduct coal. Market quiet.

A late opening of the lake shipping season is pressaged by the general plan adopted for handling the lake coal and ore movement. The governing influence throughout will be the rail situation, the object being to avoid congestion at all points and to obtain maximum efficiency from the cars in service. The vessels will be operated subject to the requirements produced by the rail situation. Thus it is announced that the lake vessels will not buck the ice this season in order to secure an early opening of lake navigation, but will let Nature take her course, this suggesting free channels by Apr. 25 or later. The railroads are busy taking ore from Lake Erie docks and are expected to improve in condition from week to week, so that the later the better for moving the limited tonnages of ore and coal that are absolutely required. Coal shipments in force will not begin until the vessel movement is fully established.

There is little being done in the coal market. Nearly all the regular contract business was done before Apr. 1, subject to any new prices the Fuel Administration might possibly establish, though it was the common expectation that there would be no change in prices. Since the reaffirmation of prices was made some points have been added to a few contracts, but in general the business was done some time ago. There is little free coal being offered in the market, while there is not a great deal of demand. Shipments were not altogether satisfactory last week, but on the whole the situation is improving, and the zoning system is gradually working out into a more orderly distribution of coal. The byproduct coal movement, which is largely exempt from the zone restriction, has been practically satisfactory, the byproduct ovens with few exceptions receiving full supplies. The market remains quotable at \$2.20 for slack, \$2.45 for mine-run and \$2.70 for screened coal, per net ton at mine, Pittsburgh district, with 15c extra permitted to be charged by any broker regularly constituted as buying agent for a consumer or retail dealer.

TORONTO

Heavy demand from consumers anxious to stock up ahead. Dealers busy. No summer price reduction. Manufacturers oppose controller's restriction. Attempt to introduce Alberta coal.

The demand for coal continues unusually heavy, as consumers are anxious to lay in stocks in anticipation of a shortage next fall. Dealers are busy and supplies are coming forward well. The usual summer reduction in price is not likely to be made, as any reduction in price at the mines will be fully offset by the increase in freight rates. The order of the Fuel Controller limiting the supply to 70 per cent. of the year's normal requirements is strongly opposed by the manufacturers, who will appoint a committee to urge that it should be rescinded. Hydro-electric power is to be substituted for industrial purposes as far as possible. Fuel Controller Magrath has issued an order that in cases where such power can be economically installed the use of coal for power purposes may be prohibited. Some Alberta coal companies are endeavoring to introduce coal from the Western mines into the Toronto market, but none from that source has as yet been received. Dealers do not regard the movement as practical, considering that the freight rates will be prohibitive.

Quotations per short ton for best grades are as follows: Retail anthracite egg, stove, nut and grate, \$10; pea, \$9; bituminous steam, \$9; slack, \$8, to \$8.50; domestic lump, \$10; cannel, \$11. Wholesale f.o.b. cars at destination as per present contracts, three-quarter lump \$7 to \$7.50; slack, \$6.50 to \$7. New prices as fixed by Government should be for three-quarter lump, \$6.11; slack, \$5.18.

BUFFALO

Car shortage cuts down bituminous supply. Jobbers get their licenses. Little Pittsburgh coal to be had here.

Bituminous—The situation does not change much, though the car supply is so light that it is hard to get shipments through. Shippers complain that the railroad operating force is lax; for if it would do the work of listing and searching for cars that shippers are so often obliged to do, there would be much less delay. Often cars get to destination after all record of them has been lost.

The difference of price between thick and thin-vein coal is making it hard to get as much Pittsburgh coal here as is needed. Nobody wants to pay extra for the Allegheny Valley coal if Pittsburgh can be obtained, and so the demand for the latter has cut out the surplus entirely. Besides, the shipments to the lakes have been run and it looks as if the shortage will increase, especially if the car supply does not improve. The Pennsylvania, on which the shippers must depend for most of the Pittsburgh coal, is short of cars, while the Buffalo, Rochester & Pittsburgh and the Shawmut lines are not so short as they were.

Quotations, based on Government prices, f.o.b., Buffalo, are \$4.45 per net ton for Allegheny Valley and Bessemer thin vein, all sizes, and \$4.25 for lump, \$4 for mine-run and \$3.75 for slack, Pittsburgh or Bessemer thick-vein.

Anthracite—The local trade complains of lack of coal in all of the sizes except chestnut, and it appears to be getting none too much of that. Shippers are not much disturbed, as they say it is always the case at this time of the year. Large consumers with furnaces lay in the big sizes now. The shippers claim that they have sold more coal in Buffalo so far this season than usual.

DETROIT

Bituminous coal arrives in satisfactory volume. Anthracite shipments are disappointing. Lake rate is named for season.

Bituminous—Shipments of bituminous coal are apparently moving freely into Detroit, though jobbers say there has not been a volume of receipts so great as to create any free coal on tracks. The larger proportion of the shipments seem to be of coarse coal, with domestic lump predominating. Slack is not plentiful, though the supply is described as improving and jobbers predict the amount received will be increased when the loading of coal for lake shipment gets fairly under way.

With Detroit industrial plants operating at nearly capacity, turning out products essential for war, there is a well sustained demand for steam coal. Some progress is said to have been made by certain of the

manufacturing establishments toward building up a reserve, though the volume of requirements for daily consumption leaves no great amount of stock available for storage. Jobbers and wholesalers are warning their customers to make the most of the present opportunity, however, on the theory that receipts are likely to be curtailed when the navigation season opens, within a week or 10 days. Except for by-product and railroad coal practically all incoming shipments of bituminous coal are being handled through the Detroit terminal pool, the expense of the pool's operation amounting, it is said, to about 1c. on each ton.

Anthracite—While fuel administrators, federal and state, are urging household consumers to put in at once a sufficient supply of coal to meet next winter's needs, the quantity of anthracite coming into Detroit continues far short of expectations. The larger number of household consumers have heating equipment designed for use of anthracite, and being unable to obtain that kind of coal are unwilling to stock up with soft coal. Little or no coke is to be had and there seems no prospect of improvement in supply. The absence of Pocahontas and New River coal increases the demand for anthracite.

Lake Trade—Ice still closes St. Mary's River and St. Clair River. It is disappearing rapidly and lake navigation may be reopened the week of Apr. 21. The carrying rate on coal to ports at the head of Lake Superior has been fixed at 48c. for the season, which will apply also to a number of long time contracts.

COLUMBUS

Stocking of domestic sizes is still going forward actively. Weakness continues in the mine-run business, and prices in certain districts are being cut.

The coal trade in Ohio continues quiet, especially in mine-run sizes. There is a good demand for domestic sizes and consequently a good movement of that grade. Outside of cutting in certain districts prices are strong at the Government figures. The tone of the trade is generally satisfactory and production is fair. Car shortage on some roads is cutting down the output appreciably. Activity is expected just as soon as the lake trade is formally opened.

Domestic business is still one of the best features of the trade. Retailers are buying rather actively as stocking on the part of householders is quite active. Some sections are still waiting for the fancy grades such as Pocahontas and West Virginia splints, but on the whole the consumer is trying to get under cover for the next winter's supply of fuel. Stocking on the part of retailers has just about reached the limit of storage space. Pocahontas is quite scarce, but there is considerable other West Virginia grades arriving. The main portion of domestic business is in Hocking and Pomeroy varieties. Jackson No. 2 lump is also being stocked, but there is considerable weakness shown in No. 4 Jackson. Retail prices are firm at the levels which have maintained for several months.

The steam business is active to the extreme. Buying on the part of steam plants is good and there is a marked disposition to accumulate a surplus to guard against an emergency. This is especially true of public utilities, which were caught short handed last winter. Railroads are also stocking to a large degree. On the whole the steam business rules firm and all available tonnage, with the exception of mine-run, finds a ready market.

Production in Ohio districts has not been up to the records of previous weeks. This is due largely to shortage of equipment, more especially open top cars on certain railroads. This is explained by the order of the railroad director to have all ore moved from the lower lake docks before the opening of the lake season. As a result of the car shortage the Hocking Valley output was curtailed to about 80 per cent. and Pomeroy B&W about 70 per cent. Eastern Ohio is still suffering from shortage of cars and its production is estimated at 55 per cent.

CINCINNATI

Efforts to secure early ordering are proving successful, but the trade is finding difficulty in securing deliveries. Car situation is not improving as expected.

Realization of the necessity of storing coal for next winter's consumption during this spring and summer has been forced upon the public by the joint efforts of the Fuel Administration and the coal trade, and it is now fairly certain that there will be a continuous heavy demand for coal from all quarters during the entire period

of warm weather. Whether the trade will be able to take care of that demand is becoming a serious question, however, as the situation at the mines in this section as to the supply of cars is giving cause for anxiety. The snows which fell during the past week, causing a decided stimulus in orders for immediate delivery on the part of domestic consumers, hampered the movement of freight somewhat, and emphasized the shortage of cars at the mines.

LOUISVILLE

Domestic demand excellent. Steam demand fair, with steam consumers holding out for better grades. Supplies low due to car shortage and shortage of labor, with few carlots being delivered to domestic consumers.

Sleet, snow and cold weather on April 10, and a full week of cold weather resulted in a regular December demand for domestic coal throughout Kentucky. Domestic consumers had let their stocks run out and had figured on getting through the season. Retailers had trouble in taking care of the heavy demand which resulted, and which kept delivery departments working overtime.

Regulations under which western Kentucky coal could not go into New Albany and Jeffersonville, Ind., which were left out of the west Kentucky zone, have been modified at Washington to permit such coal to go into the two cities across the river from Louisville.

In eastern Kentucky as well as western Kentucky much labor is deserting the mines to go into agricultural pursuits, and production has dropped off considerably due to lack of labor as well as cars. Manufacturers and large consumers are getting particular about grades, and are demanding the best of coal of any stated grade, refusing to accept dirty coal. One large coal company reported the demand as so heavy that it was accepting about one order out of ten offered, and that it had found the demand for domestic coal to be heavier than for steam grades.

BIRMINGHAM

Trade active in both domestic and steam grades. Domestic stocking slow, dealers not being able to place their requirements. Output badly off due to irregular work and sickness among the mine workers. Car shortage not being keenly felt.

Inquiry among representative domestic dealers brings out the fact that stocking is proving extremely difficult this season, the output of the mines being prorated to such an extent that retailers are only able to place from one-quarter to one-third of their usual bookings. A dealer who had approximately 7000 tons on his yard this time last year reports that he has not over 1500 tons at this time. Consumers as a whole are showing an unusual degree of indifference about laying in their coal and the orders on the books of the yards are probably not over 50 per cent normal for the time of year.

The Jefferson County Fuel Board has fixed a gross margin of \$2.50 per net ton over mine prices for dealers, which will make the retail price of prepared sizes of Montevallo coal \$6.50; Cahaba, Black Creek, Blue Creek, \$5.60; Big Seam, \$4.95; Corona, \$5.25. This price must absorb the broker's commission when acting as purchasing agent for the dealer.

The steam market continues strong, the available supply being inadequate to fill requirements. It is reported in coal circles that the railroads will endeavor to place contracts under the mine prices now in effect. Any effort in this direction will be stoutly fought by operators, who for years prior to 1917 have been furnishing the railroads fuel at little or no profit—in some cases under cost. Contracts involving from one-half to three-quarter million tons taken in this field will expire June 30, if not canceled by the Fuel Administration before that time.

Coke

CONNELLSVILLE

Car supplies improved somewhat, but reports misleading. Market quiet. Contracts absorb shipments.

It develops that the 100 per cent. car supply furnished Monday of last week

was so far beyond the preparations of the operators, accustomed for many months to greatly restricted supplies, that the cars held over and not loaded made technically a 100 per cent. car supply not only on Tuesday but also on Wednesday, and thus there was the phenomenon of a 100 per cent. car supply, in railroad parlance, for three successive days, when the actual fact was that the total cars available for the three days fell far short of representing three times the full loading capacity of the region for a day, when ovens are all in operation. Finally the ovens got the cars loaded and then the rate of influx of cars into the region was shown by there being only 30 per cent. for Tuesday, 50 per cent. for Friday and 40 per cent. for Saturday. The actual supplies for the whole week were about 55 per cent of ratings, on an average, though the average of the technical supply, taken day by day, would come out at 70 per cent, altogether a misleading figure.

On the whole there is a better car supply, due partly to the railroads getting into better shape in general and partly to the work done by the authorities at Washington who are interested in seeing heavier production of pig iron and steel. This week's car supplies promise to average as good as those of last week, and the two weeks may show an average of shipments, per week, of about 375,000 tons, including coke shipped by water. This is probably the full requirement of the furnaces dependent on the region. The "Courier" report shows for the week ended Apr. 6 a production of 333,065 tons, a decrease of 19,370 tons, and shipments of 322,398 tons, a decrease of 60,310 tons.

The coke market continues quiet, as nearly all the shipments are absorbed by regular contracts. It appears that with few exceptions the furnaces are covered by contracts for the year. The majority of these are contracts made at flat prices, averaging about \$3.25, while a few are on a ratio basis, depending on the price of pig iron, and a few are based on the current market for coke, being therefore adjusted weekly or monthly to the Government price of \$6. Scarcely any contract business will expire June 30. As consumers would be willing to take extra shipments of coke, beyond their daily requirements, to accumulate a stock, increased coke shipments expected may not at once result in coke being offered in the open market. Offerings even of foundry coke are quite limited. The market remains quotable at the Government prices, \$6 for furnace, \$7 for 72-hour selected foundry and \$7.30 for crushed, over 1-in., per net ton at ovens.

Buffalo—Jobbers report that they are practically unable to get any coke except the small amount of byproduct that is on the market, most of which is not suitable for regular furnace firing. The iron furnaces are losing their contracts by expiration and are looking eagerly for new connections. At the same time the coal supply at the coke ovens is poor, so that the output is light. With poor car supply both in and out the ovens are having a hard time to keep up with the demand. Furnace companies that did not set up as coke manufacturers when labor and material were more plenty are sorry. Buffalo has two large furnace companies that make their own coke and two that do not.

Middle Western

GENERAL REVIEW

Demand for prepared domestic sizes good, while screenings and slack market drag.

The failure of the railroads to start their storing campaign has caused operators to divert their attention to the preparation of domestic sizes, and they are having little or no difficulty in keeping their mines well supplied with orders for lump, egg and nut. During the past week railroad fuel agents have called meetings with their line operators, and this would indicate that purchasing agents are becoming alarmed at the solid front presented by the operators, who are in almost every instance contending they should not be asked to accept a figure less than that made by the Government. One of the inducements offered by the railroad is to take the output of mines with a full car supply, which argument is met with the statement by the operators that such a contract is within their belief contrary to the instructions of the Federal Fuel Administrator. At this writing special extraordinary prepared sizes are freely moving at the 20c. per ton premium price. Although some companies report difficulty in moving slack and screenings.

The maximum tonnage production in any mining district during the past week has not exceeded 85 per cent. In some localities 50 per cent. working time has been noted. However, there is an occasional railroad mine that has worked full time.

CHICAGO

One of the heaviest buying campaigns of the year by dealers was the feature of the past week.

Acting on the advice of the state fuel administrator, the dealers of Chicago have been active in not only putting all the coal possible into the consumers' basements, but in storing all the high-grade southern Illinois and Indiana coal that they could get. During the week quite a few dealers contracted for their year's supply, and in almost every instance such contracts call for equal weekly or monthly tonnage, with an understanding that should the operator at any time have any surplus they are willing to take care of it. This movement on the part of the dealers has been a lifesaver for some of the large producers in Illinois and Indiana, who had formerly provided considerable tonnage to the railroads.

Anthracite movement in this section is limited to those who have in past years had an established trade relationship, and those that have not been so favored are anxious to connect with some concern that will promise to furnish them with some hard coal.

Quotations in the Chicago market are as follows, per net ton f.o.b. cars at mines:

	Williamson and Franklin	Saline and Harrisburg	Fulton	Grundy, La Salle, Bureau
Steam lump.....	\$2.65@2.80	\$2.65@2.80	\$2.65@2.80	\$3.35@3.50
Domestic lump.....	2.65@3.00	2.65@3.00	2.65@3.00	3.35@3.50
Egg or furnace.....	2.65@3.00	2.65@3.00	2.65@3.00	3.35@3.50
Small egg or nut.....	2.65@3.00	2.65@3.00	2.65@3.00	3.35@3.50
Stove.....	2.65@3.00	2.65@3.00	2.65@3.00	3.35@3.50
Chestnut.....	2.65@3.00	2.65@3.00	2.65@3.00	3.35@3.50
Pea.....	2.65@3.00	2.65@3.00	2.65@3.00	3.35@3.50
Washed egg.....	2.85@3.00	2.85@3.00	2.85@3.00	3.35@3.50
Washed stove.....	2.85@3.00	2.85@3.00	2.85@3.00	3.35@3.50
Washed nut.....	2.85@3.00	2.85@3.00	2.85@3.00	3.35@3.50
Mine-run.....	2.45@2.60	2.45@2.60	2.45@2.60	3.10@3.25
Screenings, over 1 in.....	2.20@2.35	2.20@2.35	2.20@2.35	2.85@3.00
Washed slack.....	2.15@2.30	2.15@2.30	2.50@2.65	2.15@2.30
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Clinton and Sullivan.....	Knox and Greene.....	Eastern Kentucky.....	Pocah. and W. Va.....	West Va. Splint.....
Dom. lump. \$2.65@2.80	\$2.65@2.80	\$3.10@3.25	\$2.60@2.75	\$2.70@2.85
Steam lump..	2.65@2.80	3.10@3.25	2.60@2.75	2.70@2.85
Egg.....	2.65@2.80	3.10@3.25	2.60@2.75	2.70@2.85
Small egg or nut.....	2.65@2.80	2.65@2.80	3.05@3.20	3.05@3.20
Mine-run....	2.40@2.55	2.40@2.55	2.85@3.00	2.85@3.00
Screenings...	2.15@2.30	2.15@2.30	2.60@2.75	2.60@2.75

MILWAUKEE

Coal docks are about bare, but a heavy run of cargoes is expected on the opening of navigation in a few days. Troubles of the coal administration are many.

With Uncle Sam performing the duties of jobber and solicitor free of charge, and almost ordering people to buy their coal supplies at once, it would seem that the coal man had reached Elysium, but he is having his troubles, nevertheless. Consumers still complain that some dealers are refusing to book orders, claiming they have no coal on hand. Fuel Administrator Fitzgerald's advice in all such cases is to go to the next dealer.

Urgent appeals are being sent out by county Councils of Defense for prompt reports on future coal needs, so that something definite as to the amount which may be called for at once by lake will be known by May 1. The docks are bare of coal at present, but the opening of navigation is only a matter of a few days, when Milwaukee will be in line to receive all the coal needed to meet the accumulation of advance orders.

Because of limited lake tonnage, it is aimed to increase the consumption of bituminous coal in the Northwest. The haul for this quality of coal is comparatively short, and it is believed the supply can be kept up all summer without detriment to rail tonnage.

State Fuel Administrator Fitzgerald has received the report of the Federal Trade Commission on the coal price situation in Oshkosh. The report shows that the average gross margin on all sizes of anthracite in April and May is \$2.94 and \$2.29, respectively, and that since \$2 per ton is ordinarily an ample gross margin, it is clear the retailers of Oshkosh, on the whole, obtained unreasonable margins.

ST. LOUIS

Market extremely quiet, except on Carterville. Prices way below maximum and coal extremely hard to move. New retail prices will stimulate market some. Movement extremely slow and cars scarce. Anthracite shipments small. General condition shows improvement.

The conditions show signs of improvement here in view of the fact that new prices have been made by the St. Louis Fuel Committee on domestic coal. The lull in the market has been because of no prices for the public to buy on excepting last year's prices, and there seemed to be a feeling that this would be cut. When the new prices showing an increase were announced, on the 13th, there was an instant response in the retail demand.

For the month of April, prices remain as they are, and on the first of May prices advance 15c. a ton on everything, and on the first of June another 15c. per ton. They remain at that for the balance of the season. The present prices on Illinois prepared sizes are: Standard, \$5 per ton; Mt. Olive, \$5.25; Duquoin, \$5.50; Carterville district, \$5.75; Big Muddy, \$6.25; Anthracite, grate and egg, \$10.75 per ton; stove and chestnut, \$11 per ton.

On account of the variance in the mine price on Arkansas coal there is a \$2.50 gross margin on Arkansas-Oklahoma coal allowed the dealer on the semi-anthracite and also on Bernice anthracite. The gross on Spadra anthracite is \$2.75.

The maximum gross margin of profit on steam coal delivered shall not exceed \$1.50 per ton to the dealer. There is a reduction

gone to pieces on this coal and there are rumors that some coal from this field has gone to Chicago in large quantities that sold for as low as \$1.75 the mine. Locally it is offered as low as \$2.25 for 2-in. lump and \$1.65 for screenings. The 6-in. lump sells at \$2.35 and \$2.40.

Owing to the 20c. increase on prepared sizes, which is effective mostly in the Carterville field, the maximum market here is about as follows, beginning with the operator's price up to the jobber's commissions, and including the special prices:

	Williamson and Franklin County	Mt. Olive and Franklin County	Staunton	Standard
6-in. lump.	\$2.65@3.00	\$2.65@2.80	\$2.65@2.80	\$2.65@2.80
3x6-in. egg.	2.65@3.00	2.65@2.80	2.65@2.80	2.65@2.80
2x3-in. nut.	2.65@3.00	2.65@2.80	2.65@2.80	2.65@2.80
No. 2 nut.	2.65@3.00	2.65@2.80	2.65@2.80	2.65@2.80
No. 3 nut.	2.65@3.00	2.65@2.80	2.65@2.80	2.65@2.80
No. 4 nut.	2.65@3.00	2.65@2.80	2.65@2.80	2.65@2.80
No. 5 nut.	2.15@2.40	2.15@2.40	2.15@2.40	2.15@2.40
2-in. sergs.	2.15@2.40	2.15@2.40	2.15@2.40	2.15@2.40
2-in. lump.	.....	2.50@2.65	2.50@2.65	2.50@2.65
3-in. lump.	.....	2.35@2.50	2.25@2.40	2.25@2.40
Steam egg.	.....	2.45@2.60	2.45@2.60	2.45@2.60
Mine runn.	2.45@2.60	2.45@2.60	2.45@2.60	2.45@2.60
Washed:	.....	2.65@3.00	2.65@3.00	2.65@3.00
No. 1.....	2.65@3.00	2.65@3.00	2.65@3.00	2.65@3.00
No. 2.....	2.65@3.00	2.65@3.00	2.65@3.00	2.65@3.00
No. 3.....	2.65@3.00	2.65@3.00	2.65@3.00	2.65@3.00
No. 4.....	2.65@3.00	2.65@3.00	2.65@3.00	2.65@3.00
No. 5.....	2.15@2.30	2.15@2.30	2.15@2.30	2.15@2.30

Williamson & Franklin Co. rate is 87½c.; other fields, 72½c.

SEATTLE

Coal prices are readjusted on a sweeping scale and retail dealers' profits fixed in drastic measure.

A complete and comprehensive reclassification of the coal produced in the state of Washington, with maximum prices fixed on every grade put on the market, has just been put into effect. Readjustment of retail prices in accordance with the new mine prices has also been made and is the result of over four months' close study of dealers' costs by the local fuel administration, as recommended to the National Administrator.

The fuel administration announces classification of bituminous coal mines and maximum coal prices at the mines for the state of Washington, on the lines heretofore laid down by the President in fixing the prices of coal. If, upon completion of the investigation now being made of operators' costs in the fields affected, it is found that these prices are not justified, further modifications will be made at once.

No run-of-mine coal is to be sold from King, Pierce, Skagit or Lewis County bituminous fields except in cases of emergency, prices to be fixed by the fuel administrator. The maximum retail prices of coal which may be received by Seattle dealers shall be determined as follows: Bunker Sales—On sales of coal from dealers' bins or bunkers the dealer may add to the prime cost of one ton of 2000 lb. of the kind of coal specified the following margins:

Class 1, lump nut, egg, lump nut or lump egg mixture, \$1.10. Class 2, mine-run, mixed steam or special steam, \$1. Class 3, pea, buckwheat and finer sizes, 75c.

General Statistics

ANTHRACITE SHIPMENTS IN MARCH

March was the banner month in the history of the anthracite industry as is indicated in the record of shipments as reported to the Anthracite Bureau of Information at Philadelphia. The shipments by carrier companies in March, 1917 and 1918, and for the coal year, were as follows:

	March, 1918	March, 1917	Coal Year, 1917-1918	Coal Year, 1916-1917
P. & R. Ry.	1,339,051	1,374,051	14,798,496	12,915,229
L. V. R.R.	1,355,933	1,234,871	14,221,783	12,169,141
C. R.R. of N. J.	777,642	785,209	8,376,398	7,270,945
D. L. & W. R.R.	1,155,587	1,162,230	12,528,523	10,938,844
D. & H. Co.	861,253	728,857	8,754,113	7,247,090
Penn R.R.	519,806	517,704	5,643,501	5,519,220
Erie R.R.	864,968	792,453	8,840,579	7,722,506
N. Y. O. & W. Ry.	199,680	185,496	2,065,236	1,925,038
L. & N. E. R.R.	356,888	323,157	4,027,449	2,858,336
	7,430,808	7,104,028	79,256,078	68,566,349
* Deduction.....	*154,031	*114,953	*1,503,763	*789,760
	7,276,777	6,989,075	77,752,315	67,776,589

*Deduction: Tonnage reported by both C. R.R. of N. J. and L. & N. E. R.R.